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DOMESTIC MEDICINE
AND
SURGERY:

WITH
A GLOSSARY OF THE TERMS USED THEREIN.

BY
J. H. WALSH, F.R.C.S.
AUTHOR OF "A MANUAL OF DOMESTIC ECONOMY."

NEW AND REVISED EDITION.

Illustrated with Wood Engravings and Coloured Plates.

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PREFACE.

THE old and hackneyed proverb—that "every one is either a fool or a physician after the age of forty"—is so generally applicable in the present day (especially if by the word "physician" is to be understood a "dabbler in physic"), that no apology is necessary for the present attempt to make such dabblers as efficient as possible. Anything is better than the combination of folly and physic, which is too often present with those who fancy themselves competent to treat disease in all its varieties, either allopathically, or homœopathically, or hydropathically, or by any other system which happens to be in vogue. These, if farther enlightened, would, like most experienced practitioners of the healing art, perhaps become diffident of their powers, and, instead of "rushing in," would "fear to tread" the difficult paths of medicine and surgery. It is not, therefore, with a view of increasing the number of those who administer physic to themselves or their friends that this book is written, but rather in the hope that, if the practice is adopted by them, advantage may be taken of the information contained in it, which is offered in such a form that they may avail themselves of it with some hope of success, and without any great risk of doing mischief. But in addition to this class of individuals, there is also another to whom this book is likely to be useful, including those who emigrate to lands where professed physicians and surgeons are rarely to be met with, and who must there make use of the talents committed to their charge to the best of their ability.

For these two numerous classes, then, the present *Manual of Domestic Medicine and Surgery* has been arranged, keeping in view that they require information in two different forms, and at two different times. Thus, it will be manifest that it will sometimes be desirable for each of the above classes to study disease in general, without reference to particular emergencies; and for this purpose, Part I. is so framed that it may be consulted either as a systematic, but intelligible, treatise on the symptoms and causes of disease, which may be read consecutively, or, with the aid of the Index, it may be referred to when any individual case is to be examined.

Those who have had to encounter disease without much previous knowledge of its forms and of the methods of treating them, must have remarked that there are two great difficulties in the way—1st, in discovering the nature of the disease in question, and the name by which it is recognized; and 2nd, in adapting the treatment recommended in books to the nature of each particular case. For this reason, in the present *Manual*, these two subjects are kept quite distinct, Part I. containing the symptoms and causes of disease, Part II. the various methods adopted in their removal, while Part III. is to be consulted on all occasions, in order to discover the symptoms and treatment of any disease when once its name is known, without which it would be idle to search for them excepting by taking advantage of the following method. Thus, supposing that the person who is making the search is wholly ignorant of the contents of Part I., and yet has to make out the nature of a particular attack of disease, then Part III. will come to his assistance in this way:—Let him take some prominent symptom presented by it, such as *painful breathing;* then turning out BREATHING, *painful*, in Part III., he will find that it is a symptom of inflammation of the substance of the lungs, 76; of pleurisy, 79; of a broken rib, 440; or of muscular pain, 81. He will at once know if it is possible the rib can be broken; and if not, then the disease is either one or other of the three mentioned besides. Turning to pages 76 and 79, the diagnostic symptoms there mentioned will readily indicate to which of those two diseases the case is to be referred, or if to neither, then by the exhaustive process of reasoning, it must be one of muscular pain; and on examining that affection at page 81, it is found that all the symptoms there given coincide with it most exactly. By this process of reasoning, it will generally be practicable for any one of the most ordinary powers of judgment to come to some conclusion on the subject of diseases which are not very obscure; and after having, by the aid of Part I., satisfied himself of the accuracy of his diagnosis, he may at once ascertain the proper treatment by turning to the page in Part II. pointed out in the Index, under the head of *the treatment* of the disease which he has decided it to be. In this part special and particular directions are given, in order to lighten the task of the inexperienced observer who is completely bewildered if he finds that his choice must be made between half a dozen remedies, the directions for using which are so general as only to be useful to the practised physician or surgeon. To avoid this difficulty, nearly 500 separate prescriptions are given at length, some of which, it is true, are repeated more than once with slight variations; but this has been thought better than leaving it to the judgment or care of the reader to find them out by referring to another page. Mistakes are so easily made, that no pains should be omitted to avoid them, and certainly a few repetitions are far better than to incur any unnecessary risk.

It is to be hoped that this combination of the advantages of a series of treatises on each disease in the two first parts, with the alphabetical arrangement adopted in the third, will meet all difficulties, and bring the subject within the scope of every one who will take the trouble to read the plain directions which are given throughout. A Dictionary of Medicine is a most useful book of reference to those who already possess the key to its stores, but without it they are with difficulty reached; and hence, in the present *Manual*, the attempt has been made to combine the alphabetical arrangement, which is the basis of a dictionary, with that which is usually adopted in elementary works.

Throughout the *Manual*, every thing is described in language which may be readily understood, with the exception of the signs or abbreviations which are used in the prescriptions throughout the Second Part. This, however, is not without an object, which is to prevent errors in the quantities; for if common abbreviations are employed, (dr.) standing for *drachms* may readily be converted into *drops* or *vice versâ*. To avoid this risk, therefore, the following four signs are introduced, and being similar to those used in ordinary physician's prescriptions, a comparison with any of them in the possession of the reader may more readily be made. They are fully described at page 221; but to prevent mistakes are repeated here, consisting of (O) for *pint* (octarius), (℥) for *ounce*, (ʒ) for *drachm*, and *minim* being used at length or with the abbreviation (*min.*) The use of Roman numerals, and of the abbreviation (ā) for *of each* and (c) for *cum* (with) may also be mentioned here, though described at length in the same page.

The diseases peculiar to the various periods of life and their treatment, with those also of the female sex, are grouped together for the advantage of ready reference; and an attempt has been made to bring the diseases of the skin within the scope of domestic treatment. This would be a hopeless task without the aid of coloured illustrations, the great expense of which has hitherto prevented their adoption in treatises designed for the million. Modern science, however, triumphs over all difficulties; and the drawings by Messrs. Wells and Scott, engraved and printed in colours by Mr. Evans, though not perhaps capable of comparison with highly-finished paintings, are wonderful specimens of this new art, and are sufficiently faithful to the originals to enable the careful observer to distinguish any of the eruptions represented. The remaining engravings are well executed by Mr. Hodgkin; but most of them can only claim to be faithful copies of illustrations previously published by the highest authorities in anatomy and surgery.

In conclusion, it may be observed that the *treatment* recommended throughout is not restricted within the narrow bounds of any particular school of medicine, but is derived from all sources without bias or prejudice, and tested by an extensive practice of nearly thirty years' duration, in various parts and among all classes.

J. H. W.

PREFACE TO THE NEW EDITION.

Since the first edition of "Domestic Medicine" was published only a few novelties have been introduced into the department of the healing art of which it treats. Chief among these is Chloral Hydrate, which is largely used by the fair sex especially, both as a sedative and stimulant, and to the use and abuse of which special attention is now called. Carbolic Acid and Condy's Fluid are also worthy of notice as disinfectants; and in particular, Podophyllin should not be forgotten as an admirable substitute for Mercury in increasing the secretion of bile. An account of most of these new remedies is introduced into the body of the work either briefly or at length, and in the former case a more extended description is added in an Appendix.

In addition to the above, twelve coloured illustrations of poisonous plants met with in this country are introduced at pages 170 *et seq.*; and they will, I think, serve the purpose for which they are intended.

The Cedars, Putney, *July* 1875.

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A MANUAL
OF
DOMESTIC MEDICINE AND SURGERY.

PART I.

GENERAL PRINCIPLES OF MAINTAINING HEALTH AND REMOVING DISEASE.

BOOK I.—GENERAL LAWS WHICH REGULATE HEALTH AND DISEASE.

CHAP. I.

DEFINITION OF HEALTH AND DISEASE.

SECT. 1.—DEFINITION OF HEALTH.

1. IN the present artificial state of society, the health, both of individuals and communities, is always comparative, none of us being quite free from the ill effects upon our constitutions, of excess in the indulgence of our appetites, or the influence of bad air, defective drainage, or mental excitement upon our nervous systems. Just as it is almost impossible to find a perfectly sound horse in this country, because all have a "screw loose" somewhere, so a human being with a "sound mind in a sound body" is equally a "*rara avis.*" But in common language we are accustomed to use the term "good health" as meaning that state of the system which is the average condition of those who are free from absolute disease. The different degrees of health ascend from "good" to "strong" and "perfect," which is the highest term used; while below the average the adjectives "pretty fair," "delicate," "feeble," "bad," and "very bad" mark the descending scale—the last term being of course only applicable to those who are the subjects of disease.

2. Nearly synonymous with the adjective "healthy" is the word "normal," now fashionable in scientific writings, but really implying nothing more.

SECT. 2.—DEFINITION OF DISEASE.

3. Just as we are compelled to use comparative terms in alluding to health, so in describing the state known as "disease" we are equally driven to deviate from the strict meaning of the word, which implies *any* departure from health; and in our ordinary language we confine it to such changes from the state of health above described as are well marked by acute symptoms, or such as leave permanent alterations of structure in some organ or organs. While to those slight functional derangements which are only temporary in their nature, and which as they are generally caused by errors in diet, &c., so they disappear when the cause is removed, we apply the term "disorder." This definition, it is true, is not strictly logical or scientific, because it is quite impossible to draw the line which shall separate the two; but for common purposes they answer well, and though, like the animal and vegetable kingdom, when they meet, it is difficult to distinguish them, yet at all other points it is easy enough to understand the difference between disease and disorder.

the one being generally, and probably always, accompanied by temporary or permanent change of structure, while the other is never attended by anything more than temporary disturbance of function.

4. As the scientific term "normal" signifies healthy, so the word "diseased" is replaced by "abnormal" in modern language, when it is intended to be very precise.

Sect. 3.—Influence of Temperament on Health and Disease.

5. Both the healthy and diseased conditions of the human body are considerably modified by what is called the "temperament" of the individual. This term, like many others which we shall meet with, is so well known as scarcely to need description; and yet when we come to define it we are at a loss, since it is almost impossible to carry out our ideas with language which will be accurate enough without being prolix. Suffice it, therefore, to say, that it is chiefly marked by a difference in external form and complexion, though most probably there is also a corresponding change in the internal organs. Hence, it is only necessary to describe each kind, in order to show what the meaning of the term "temperament" really is.

6. It is usual to group these variations under four heads—1st, the sanguine; 2nd, the phlegmatic; 3rd, the bilious; and, 4th, the nervous temperament. Some authors modify these still further, by using the terms *nervo-lymphatic*, *sanguineo-nervous*, *bilio-nervous*, &c., to mark the compounds of two temperaments; but these minute attempts at definition are scarcely desirable for common purposes.

7. The sanguine temperament is indicated by a general fulness of form, without excess of fat; the muscles being well developed and firm, if the health is good. The blood circulates actively in vessels of good size, as marked by a full and rather frequent pulse. The complexion is florid, and generally fair, the hair light, and the skin soft and transparent. Both body and mind are excitable, and capable of sudden exertions; and the passions generally run high.

8. The phlegmatic, sometimes described as the lymphatic temperament, is known by a roundness of form, not caused by fulness of muscle, but by an accumulation of fat. The blood vessels are small, and the circulation is languid, as is the case with most of the functions of the body. The hair is of a middle shade, the complexion devoid of colour, and generally opaque. The features are round and full, and the expression of countenance devoid of character and energy.

9. The nervous temperament is attended by a spare and slight form, with slender but firm muscles; circulation quick, and easily acted on by external impressions; complexion pale, but clear; eyes sparkling, and of all colours; features sharp, and expression animated, and changing with every new impression; mental faculties acute, and apt to re-act upon the bodily organs.

10. The bilious temperament is accompanied by a full and firm outline, generally of an abrupt and angular form; features strongly marked, and countenance sombre, with a firm expression of character. The complexion is dark, and somewhat sallow; eyes and hair usually dark-brown or black; circulation well marked, and the blood vessels large, especially the veins on the surface. The character is generally decided and energetic, and there is a capability of long-continued exertion, both bodily and mental.

11. These several temperaments are variously influenced by external circumstances, both in ordinary health and in a state of disease. Thus, the nervous temperament will often be suited to a quiet and secluded as well as relaxing situation, which would be wholly unfitted for the bilious. So, with regard to absolute disease, the sanguine is most prone to inflammation and other acute disorders of the circulation. The phlegmatic is liable to congestion and glandular enlargements; the bilious to disorders of the stomach and liver, with their attendant evils; and, lastly, to the nervous tempera-

ment belongs all the fearful train of mental derangements and nervous complaints. The reason for these coincidences we cannot arrive at in all cases, but generally we conclude that the above well-marked changes are each more or less caused by some corresponding disease of an organ which is more highly developed than usual in the particular temperament.

SECT. 4.—DIATHESIS AND IDIOSYNCRACY.

12. In addition to the temperament which is marked by external form and colour, &c., we have in many cases a peculiar condition of the system, in which there is some tendency to a particular disease. This is probably, in most cases, owing to error in diet either of the present or past generation; but, at all events, there can be no doubt of the fact that we often meet with individuals, otherwise tolerably healthy, who are more than usually liable to *gout*, *stone in the bladder*, &c. These states are called the *gouty*, or the *lithic acid*, *oxalic acid*, &c., *diathesis;* the term being only invented to save words, and to conceal our ignorance of the seat of disease.

13. As we have adopted the word diathesis to conceal our want of knowledge, and to avoid the waste of words which would be required in remarking "that Mr. — is unusually predisposed to gout," &c., so there is a necessity for the adoption of a term which shall convey the knowledge of the fact, that certain individuals differ from the rest of their species with regard to the action of some kinds of food and medicine upon them. Thus, some cannot eat oysters without being ill; others cannot bear the smallest dose of laudanum; and others, again, are purged by that drug, and constipated by castor oil. These cases, though extreme, are not unknown, and the individuals to whom they belong are said to possess an *idiosyncracy.* Of this there are three kinds:—1st, that in which an unusually small dose of a drug will act injuriously upon the system; 2nd, that in which some kind or kinds of food which are generally wholesome are attended in certain individuals by injurious results; and, 3rd, the case where a drug has an opposite effect to that which it generally exercises upon mankind.

SECT. 5.—SEX AND AGE.

14. It is scarcely necessary to remark, that the above elements exercise a marked influence upon individual health and its opposite. In the structure of the male there is more tone and power, which, again, are increased in activity by his occupations and habits, rendering him particularly liable to active inflammations. On the other hand, the female sex are naturally more delicate in their frames and more lax in their fibre; so that we might expect what we find, that they are more frequently attacked by nervous disorders, and by those diseases, also, which follow sedentary occupations, to which they are more confined than man.

15. Age, also, is well known to affect the frame and constitution of all, the child being in every respect a different being to the adult, and both also to the old man. Thus, in infancy the formation and development of the teeth, and the urgent calls upon the digestive organs for the materials of which the body is built up, render the diseases of the stomach and bowels more common than at the subsequent periods of life. At this age, also, certain diseases to which all are more or less prone are of necessity more than usually prevalent, such as measles, scarlet fever, smallpox, and the like. At the next period the glandular system seems to be the most tried, probably in consequence of the great quantity of worn-out material which is carried through them, and hence we have enlarged lymphatic glands, scrofula, &c., together with other similar diseases, such as consumption. After the period of adolescence come the active fevers or inflammatory diseases engendered by the peculiar and unnatural lives we lead; and, finally, we are worn out by the diseases incidental to old age, and marked by diminished sensations and mental manifestations, with feebleness of muscle, scanty secretions, and, as in

the first period of existence, a low development of heat.

SECT. 6.—CLIMATIC AND EPIDEMIC INFLUENCES.

16. Among the most powerful agents in affecting the health of nations and individuals is the state of the atmosphere which they breathe, with reference to its *temperature*, *moisture*, *weight*, and *electrical condition*, &c. These, together with certain poisonous and scarcely definable elements floating in it, constitute the *climate*, with which it is notorious the health of mankind is wonderfully connected. But it is not a little remarkable, that a climate which is suited to certain nations is deadly to others; and, again, that one which is advantageous at one time, or for a certain period, is afterwards exactly the reverse. Thus, a residence at the sea-coast is a panacea for certain complaints prevalent in the inland districts, while it is often unhealthy to its own denizens. But these facts are so well known as to deserve the name of truisms.

17. The decomposition of vegetable substances, such as dead leaves and other similar exuviæ, especially in tropical climates, leads to the development of certain gases or subtle floating substances, to which the name of *malaria* is given, and which produce fevers of a low kind, as well as other low states of the system, with impaired vigour and tone, known as marsh fever, ague, &c. In this country, the great amount of drainage carried on of late years has almost caused this condition of things to disappear; but in some localities it still lingers; and even where ague is not known, except by name, listlessness and want of energy of the body and mind are common enough. With our present habits, a much worse fight is now made against *malaria* than was formerly the case, because we are not so much braced by exposure to the weather and by active exercise, but are content to roll about in carriages, and when we travel we are protected from wind and rain in railways or steam-boats. Hence, though the poison is less, and is insufficient to act as of yore, it is probable that to it we owe some of the multifarious forms of dyspepsia, headache, neuralgia, &c., which form the staple of the grumblings with which the ladies are said to treat each other when they have no better employment. These diseases, thus peculiar to certain situations, and caused by local peculiarities, are said to be *endemic*, which means existing *among a people*.

18. Beyond the direct agency of climate and malaria, we have also a most peculiar condition, of the essence of which nothing is known, and of which we should be wholly ignorant, but for its powerful effects upon mankind, as well as upon domestic animals. We find at uncertain periods an old, or perhaps a new disease suddenly break out with such virulence as in some cases to decimate a people, as was the case formerly with the plague, and of late years with the cholera in this and other countries. Why this should be so we know not, but of this fact we are compelled to be aware, and we express it by the term "epidemic," which simply means coming upon, or *attacking a people*—or, in common language, prevalent. Thus, a disease may be said to be prevalent or epidemic, whichever term may be preferred; and the most common one of this kind has received the name, *par excellence*, of influenza, which is merely an epidemic catarrh.

SECT. 7.—NATIONAL AND INDIVIDUAL HABITS.

19. Nations and smaller communities differ widely among themselves in their manners and customs, and more especially in their articles of diet, and the quantity of them which they consume. Much of this depends upon climate, which at one extreme leads the Esquimaux to depend upon train-oil and saw-dust, and at the other permits the indulgence in vegetables and fruit without animal food. So also with regard to fermented liquors, which are comparatively innocent in the cold regions of the north; but if indulged in to any great extent near the equator, are productive of disease in its most frightful forms. But, inde-

pendently of these broad accommodations to nature's laws, we find in the same latitude that different races have adopted quite opposite habits: some are temperate in diet, but give way to their passions in other ways; others, again, are proverbially moral and chaste, and yet are given to excess in animal food or spirituous liquors, or to the abuse of opium or tobacco. All these influences operate materially in increasing or diminishing the general health of nations, and in the same way, but perhaps not quite to the same extent, they act upon individuals. The reason why the amount of influence is not so great in the latter case is, that the change in the constitution is not carried on so completely by hereditary descent, from parent to child, since it seldom happens, fortunately for the human race, that any particular indulgence of the passions or appetites is transmitted, together with the impaired constitution produced by it. A drunken father will often act as a warning to his son, and, as a consequence, in the next generation the evil results are washed out. But in nations this is not the case, for the mass of injury is transmitted, and gradually goes on increasing, until, in the end, the cause is sufficient to extirpate the race—as happens to the Red Indians, from their indulgence in ardent spirits; or else they change the national habits, and in time throw off their consequences. But, besides these well-known facts, others connected with the keeping up of a good selection to continue the race are also concerned. So we find that, in consequence of extensive wars, the picked males of a whole nation have been greatly reduced in numbers, followed most surely by a diminution in the appearance, bodily strength, and numbers of the next generation. This has been lately exemplified, in a marked manner, among the French, who lost a very large proportion of their adult male population during the long war from 1783 to 1815. The consequence has been, that the lowest standard of their soldiers has been reduced nearly six inches, and their army, brave and fiery as it is, is composed of the smallest men in Europe. In smaller communities the change produced by improper food and lodging is even more apparent, as is shown in the manufacturing districts of Lancashire, when compared with the rural districts of that naturally favoured county. Nowhere is there a finer and taller race of men than those composing the inhabitants of the villages of this county, the beauty of whose daughters has become celebrated under the title of the "Lancashire witches;" but see the same race after fifty years' toil in the factories of Manchester, with all its attendant evils. No one would, without evidence, believe them to be closely related in blood, as many of them are; and no stronger support is required to prove the evil influence of their mode of life.

20. Among the middle classes of England, for whom this book is chiefly designed, the chief errors in their habits and customs consist in their abuse of over-stimulating food, such as butcher's meat, malt liquor, &c. The climate is no doubt of such a variable nature, and the air is so moist, that a larger quantity is required than in France or Italy; but still, as we shall hereafter see, not to the extent which is practised in this country.

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CHAP II.

ON THE MAINTENANCE OF HEALTH BY MEANS EXTERNAL TO THE BODY.

Sect. 1.—Protection from Weather.

21. It is scarcely necessary to observe, that in this country a house-lodging is necessary to health; for though during the summer months it is possible to "camp out" in gipsy fashion, yet in the cold and wet weather of the winter and spring months none but the most hardy could long bear the exposure. Hence it is that as this necessity is felt by all classes, so when the want of money cripples the tenant he is compelled to have recourse to a very limited space, and often to share his small room with five or six other lodgers of both sexes. The one single requisite which he gains is the freedom from wind and wet, and to this everything else is sacrificed; but in spite of all, there is no doubt that he gains more than he loses by this immunity, for though crowded dwellings are a great evil, exposure to weather is a greater.

Sect. 2.—Artificial Warmth.

22. After protection from weather, the next in importance in preserving health in this climate consists in the maintenance of a proper degree of warmth, which can only be effected by artificial means. Among the poorest classes their natural warmth is husbanded as far as possible by the accumulation of several individuals in one small room, by stopping up all apertures which would otherwise ventilate it, and by the use of as many articles of clothing as can be collected together. This, however, sadly interferes with the proper supply of fresh air; and, therefore, in order to allow of this necessary of life, all those who value health have recourse to artificial warmth, produced by the combustion of fuel in some shape or other. For this purpose nothing is so really useful as the open grate, burning coal, and heating as well as thoroughly ventilating the apartment. It is not the most economical mode of supplying heat, but it is the most grateful to the feelings, and to the Englishman is associated with his dearest tie—his home. A stove will give out a greater amount of heat, in proportion to its cost, but the ventilation is very imperfect, and the skin of those using it feels dry, while the respiration is uneasy and the spirits dull. For large numbers collected together the union of the two modes of heating may be advantageously employed; but for small families, both of the poor and middle classes, the open grate will, until some better substitute is invented, still maintain its hold. (See *Grate and Stove.*)

23. In addition to the production of heat by combustion, it may be beneficially husbanded by the use of non-conductors of various kinds. These may be partly employed in keeping the air of our apartments from a too rapid admixture or communication with that outside, and partly in covering our bodies with a layer of the same material, which has the same property of retaining caloric. Thus, it is an object to have the walls of our houses made of such a kind of brick or stone as shall retain the heat as much as possible; and this will in general be found to depend upon their freedom from absorbing power as regards wet. The more porous a material the better non-conductor it is, *provided it can be kept dry;* but the moment it admits wet, like a sponge, it lowers the temperature, partly by immediate contact with the water, which is generally below that of the walls themselves, and partly by its evaporation in drying, during which process, as is well known, a large quantity of caloric is carried off. The walls should, therefore, be thick and *dry;* but if there is space, it answers remarkably well to take advantage of the non-conducting element—air, and maintain in the middle of the wall a layer of it *at rest.* This is effected by building

the outer walls in two portions or layers, with an inch or two intervening between them. They must be tied together at short intervals by a single brick, but still containing between them a thin *stratum* of air; and in this way a greater sensation of warmth is given to the frame than by any other wall whatever. This principle may also be carried out with advantage in the windows, which, if made in the usual way, cool the air very rapidly in severe weather by immediate conduction of the heat contained in the room to the atmosphere outside. To prevent this, it is only necessary to glaze the sashes on the inside as well as the outside of each, the bars being made with a double rebate for that purpose; or, if preferred, two sashes may be introduced in each opening, as is generally practised in Russia. Neither of these plans interferes with ventilation, because in any case no air passes through the glass; but the only effect of the double glass is to prevent the air in the neighbourhood of the windows from being rapidly cooled by contact with the glass, which itself is reduced in temperature by the air outside. Every one must have felt, in the depth of winter, a stream of cold air passing down upon the body from a large window when sitting near it, and yet on examining the sash it has been found that it is quite air-tight, and that no draught has produced the disagreeable feeling which I have alluded to. Ventilation should be provided for by other means, and we ought to have it at command, while our doors and windows should be made as air-tight as possible; which, by the way, is only after all an approximation to the quality which is desired, for there will almost always be considerable crevices around them. French casements may be made almost air-tight, though they are often "draughty" enough; but sashes must have room to slide, and doors must clear the carpet. Such partial streams, however, can never be injurious; and it is only when cold air is admitted in large volumes upon the body that it leads to mischief.

24. Warm clothing in this climate is essential to health, and especially in young children and growing persons of all ages. Many people have an idea that exposure to cold hardens the constitution of the child, and renders it more healthy than it otherwise would be; but this old-fashioned notion is now almost dispelled, and we have come to the sensible conclusion, that as we ourselves should inevitably be the worse for the exposure of our legs and arms to the winds of winter, so our children are likely to feel it still more, and to suffer in the same way. The great criterion is the sensation of comfort, which a proper amount of warm clothing gives; taking care to stop short of such a quantity as will prove too much for the degree of exercise which is to be taken. Thus, supposing the child is of an age to run, and that he is likely to do so, he should not be clothed as he would be if slowly walking or standing still, or remaining in-doors without a fire. But let it always be observed, that the skin should never be thoroughly chilled if it can be avoided; though, of course, I do not allude to the slightly cold hands and feet which most persons suffer from in very severe weather, while taking only moderate exercise.. Flannel next the skin is a necessary of life in the winters of this climate, and old as well as young are the better for it, and would escape many diseases if they would carefully adopt its use. So, also, woollen gaiters for the bare legs of young children are now most properly come into general use, by which many a severe cold and cough is prevented, and the health of the body in other ways preserved. Yet though all these precautions and "coddlings" (as old-fashioned people call them) are now so universally introduced, we do not find children more delicate; but, on the contrary, they are as a rule far more rosy and healthy-looking than they were twenty years ago; and I believe as the present generation grows up, it will feel the good effects still more.

SECT. 3.—VENTILATION.

25. AREA REQUIRED.—By a refer

ence to the theory of respiration, as described under the article of that name, it will be seen that a constant supply of fresh and pure air is necessary to its proper performance. Now it is manifest, that if we husband the heat of our bodies and fires by adopting all the expedients which modern art offers to us, we at the same time cut off the regular supply of air which our lungs demands, and therefore it is the more necessary that we should adopt some regular and additional means of obtaining the air we require. For this purpose it is found by experience, that a space of at least 1,000 cubic feet will be required as the area in which a human being may be allowed to remain under ordinary circumstances, and with the usual supply in addition. If a less space is adopted, the air to be kept pure must be so frequently renewed, that it has the bad effect of a "draught," and cools the body so rapidly as to "give cold." This, therefore, is the first point to be considered; and it may be laid down as a rule, that an area of not less than 1,000 cubic feet and not more than 2,000 will be the best space, under all the usual conditions, for each human body when at rest. The former of these areas will form a cube measuring 10 feet in every direction, while the latter will embrace two such measures of capacity; and thus we arrive at the fact, that a room 16 feet long, 12 feet wide, and 10 feet high will only properly accommodate two persons at the most, and will be still better for one only, especially in cases of sickness or long confinement from any cause.

26. THE SUPPLY OF AIR to the above area, if the windows and door are not remarkably tight, and there is an open fire-place, may safely be left to find its own level—that is to say, supposing there are only one or two persons in that space; but, on the contrary, if the air is excluded by means of very close-fitting doors and windows and especially if there is either no fire-place or a close stove, some further provision must be made for the introduction of fresh air, and for its exit when it has been used in respiration. It is very difficult to effect this object without the agency of heat, which, by causing a draught up the chimney, carries off a certain amount, and in so doing draws in an equal quantity from the external air through the most readily available openings. Whenever, therefore, the weather is too hot for a fire, and yet the room requires ventilation, because of its containing one or two persons for some hours together, all that is needed is to throw open the windows more or less widely, the size of the aperture made being in proportion to the heat and to the number of persons to be supplied. In case it is necessary to provide for a distinct supply of air, independently of all ordinary openings which are made air-tight, the best plan is, first of all, to provide for the out-draught by fixing an Arnott's valve in the chimney flue near the ceiling, and then introducing an air-drain from without, taking care that *its outer mouth is near a magazine of as fresh and wholesome air as can be met with.* This drain need not be more than three or four inches in diameter, if for an ordinary-sized room; and it should be carried for some distance by the side of the fire-place and flue, but perfectly distinct from the latter, until it reaches nearly to the level of the ceiling, when it may turn off at a right angle; and being conveyed close beneath the cornice, it may open in as many places as may be thought desirable. To prevent the air impinging upon the skin as unpleasantly as it might do if allowed to enter without any guard, it is better to fix at each inner opening a piece of zinc, having its lower edge attached to the bottom of the air-hole, and then leaning obliquely into the room: with its sides made good, it throws the stream of air upwards, and disperses its force by breaking it against the ceiling. On this plan is the air-valve known and sold as "Sherringham's," though in use many years ago, especially in church windows. Where a large family are collected together in a room which contains a less proportion than 1,000 cubic feet per head, it is necessary, at the intervals of meals, &c., to change the

air most thoroughly, by throwing open the windows and doors, and leaving them so for the time which is occupied elsewhere. This, however, is only a poor substitute for proper ventilation ; but, at all events, it provides an occasional supply of good air. It is also desirable to provide for the thorough ventilation of all staircases and other magazines of air, which are sometimes so constructed as to be worse than useless for the purpose of supply—receiving the products of combustion and respiration, and retaining them unchanged. In all cases, if there is no staircase window capable of being opened during the day, there should be a large valvular opening, at least two or three feet in diameter, fixed at the top, which allows the escape of the foul air, and draws a fresh supply from below. With these expedients any ordinary house, *if surrounded by healthy air*, may be made wholesome, and supplied with that which is one of the chief necessaries of life.

SECT. 4.—LIGHTING.

27. THE LIGHT OF THE SUN is in some way essential to the due development of animal and vegetable life, and therefore all living animals, and especially children, should be submitted to its influence for a certain time daily. There is, however, a happy medium in the amount of sunlight which can be safely borne; for it is well known that if the head is submitted to the full and direct rays when the sun is overhead, and especially in a tropical climate, injurious consequences ensue in the shape of what is called a "sunstroke." But though the strong rays of the sun will burn up vegetable life, and destroy that of animals when they are undefended, yet the milder streams which are given off in the morning and evening of the summer months, and in the middle of the day during the winter, are wholesome and enlivening, and should be eagerly sought for by all parents and managers of youth. But beyond this out-door good effect of the sun's direct rays, it is found that within the house also it is necessary to provide a full supply of light, together with the admission of the full influence of the sun through the windows for a certain portion of the day. Hence, it is desirable that nurseries and schoolrooms should face more or less towards the south, avoiding the north as far as possible. It will be necessary in the height of summer to provide for the exclusion of the sun by blinds, but in the morning or evening they may be drawn, with a beneficial result in rendering wholesome the air of the room, and in giving health and strength to its inhabitants.

28. ARTIFICIAL LIGHT should be so managed as to avoid consuming the air of the room to any great and injurious extent. It often happens that workmen or workwomen are assembled together in rooms too small for the requirements of their lungs; and, in addition, for the sake of carrying on their work properly, they are furnished with one or two strong gaslights each, which consume quite as much air as the human beings themselves, so that, instead of being allowed 1,000 cubic feet each, the amount is sometimes reduced to 200 feet per head, one-half of which is devoted to the combustion of the gas. For instance, a room 16 feet long, 12 wide, and 10 high will often have 10 work-people in it, with from 10 to 20 gas-burners. and this area would only allow the space above described for each. From economical considerations connected with a want of space in crowded localities, it is perhaps impossible to avoid this limited allowance of air; but, at all events, there can be no difficulty in separating the gas while burning from the whole mass by means of that transparent medium, glass. It is only necessary to carry up a small zinc shaft in front of each workman from the bottom to the top of the room, and to glaze this opposite the burner, so as to allow the rays of light to escape in the proper directions, while the air is admitted from below, and carried out above after its combustion in the flame of the lamp. Such a chimney would not cost more than 10s. per head; and, in addition, by placing a valve in the upper part, it may be made to assist

in carrying off the spoiled air from the room itself. When candles are used for lighting private rooms, and, indeed, even in most cases of the employment of gas in private houses, the proportion of air allowed is generally sufficient to allow of the light being burnt in the air of the room; but when a very strong light is required, either for ornamental or useful purposes, it is better to contrive an opening above it, by means of which the burnt and foul air, while still heated, may escape. This opening being capable of having its mouth closed by a valve, need only be used during combustion, and thus all down-draught at other times is easily avoided.

Sect. 5.—Cleanliness.

29. The advantages to health of cleanliness have passed into a proverb, it being considered by the framers important to the body as godliness is to the soul. Indeed, although we find children in rude health often covered with dirt, yet it is not in that case of a kind which is meant by the framers of the proverb, but is generally what is called somewhat paradoxically "clean dirt"—meaning the dirt of the ground, not that of the body. Dirt, moreover, when thus applied to the skin, may even be used beneficially—that is, when accompanied with the friction which a contact with the soil often occasions. All the higher animals are covered with a layer of scarf-skin, which is constantly wearing away and being renewed, and which is pierced by fine canals, carrying off perspiration or some analogous fluid. If these openings are stopped up their office is interfered with, and the health of the body suffers in proportion to the stoppage. Hence it follows, that cleanliness, by removing the obstructions to these openings, is useful in that way; and if the body is to be kept in high health, the skin must be washed or dry-rubbed at short intervals of time, the minimum of which may be set down as of daily recurrence.

30. This cleanliness of person is, however, only a small part of the duties of life in this department; for it is necessary besides to take care that no accumulation of dirt shall occur either in our houses or external to them in situations which are likely to convey to the interior the gaseous results of their decomposition. It is now well ascertained that every domestic animal, as well as man himself, is injuriously influenced in his health if he breathes air impregnated to any extent with exhalations from decomposing exuviæ proceeding from his own body, or probably from those of others similar to himself. It is also a recognised fact, that decaying vegetable substances give out gases which are more or less prejudicial to man, so that on every consideration it is desirable to enjoin strict cleanliness of person and house, by which alone the chance of this mischief accruing can be prevented. Personal cleanliness has been already alluded to, but beyond this, house-cleaning by means of the scrubbing-brush is a great advantage; and, more than all, DRAINAGE must be attended to. It seems to be a general law of nature that the exuviæ of one class of animals or vegetables, though prejudicial to themselves, are not only not injurious, but sometimes even advantageous to others somewhat different from them. Thus, the wheat-plant flourishes in the soil which is stained by the roots of the turnip; and this last, again, follows some other crop, with a healthy growth. So, again, grass land "stained" by sheep will feed with advantage the cow or the horse; and so a farm-yard, though reeking with the manure of the cow, horse, and pig, is not unhealthy to the family of the farmer, though if the same amount of human manure were beneath their noses they would speedily feel its ill effects. From these facts it has been concluded—and the theory is well supported by numberless proofs—that the drainage of every house should be carried off to a distance from it; or, if that is impossible, it should be buried at a depth below the surface, which will ensure its being kept at such a low temperature as is opposed to its decomposition and gaseous distribution. We must, therefore, contrive in all cases,

1st, to keep our persons clean, and the pores of the surface open by bathing or washing, followed by friction, or by dry friction alone, together with clean linen; 2nd, to purify our houses by frequent washing, dusting, &c.; and 3rd, to construct them so that all the drainage of the house shall be carried off, and in some way prevented from decomposition in any situation which will allow of its gaseous return to the interior, or to the adjacent grounds. These several subjects are treated of under the articles *Baths* and *Drainage*.

SECT. 6.—EXERCISE OF BODY AND MIND.

31. The importance to health of the due exercise of the bodily and mental powers can scarcely be over-rated, but in the present day the former is sadly neglected. Neither can be safely omitted without injury to the other, for as they re-act one on the other, so if the body is employed without the mind it becomes a toil which tends rapidly to wear it out; and if the mind is occupied while the body lies idle, the result is that the grosser machine becomes rusty and refuses to carry on the mandates of its superior in a wholesome and satisfactory manner. Labour is the great end of our being, and its opposite, idleness, is well said to be "the root of all evil." Those are the most to be envied who are compelled by their position to embrace a life of moderate toil, but who, at the same time, can vary and enliven it by a change from one kind to another, and from bodily to mental effort, or *vice versâ*. Indeed, when only one department is of necessity occupied, the other must have work found for it, or mischief will be sure to follow in course of time. Professional men of every grade should find some bodily occupation in the intervals of their mental toil, and will find that by thus changing from one to the other far more benefit is derived than by absolute idleness. The whole should only lie fallow during the hours of sleep; and if both are alternately at work during sixteen hours of the day, the rest during the remaining eight will be sound, wholesome, and refreshing. Thus, by occupying one-half of our waking hours in the pursuit of the necessary duties of the day, eight are still left for meals and for a change of occupation to others of a lighter and different character; or if the regular employment happens to be of a bodily or light mental character, then in the interval the mind may beneficially be employed upon scientific subjects of a comparatively abstruse character. The following remarks, extracted from a lecture by Dr. Beale, are so true to fact, that they must come home to the experience of most of us:—"The purely independent part of mankind—those at least who have not devoted themselves to some useful subject—deserve our pity rather than our envy. How many days in the year are wretched to the unemployed, if the weather be unfit for pleasurable employment out of doors!—what complaints, what ennui, what misery! To the employed bad weather is not agreeable, but they are not dependent on it, and time passes away imperceptibly; while the man of no business is counting the minutes, and wearied out with the length of his day. If we could get a statistical account of the number of hours satisfactorily employed by all classes of society, and the number of wretched ones, or those passed unsatisfactorily, would not the balance be greatly in favour of the working-man? Is it not almost certain that the real working-man, he who works with his hands, is the happiest member of society, and most completely fulfils the laws of his Maker? If his work be not so laborious and long-continued as to deprive him of time and inclination for any employment of mind, and he makes use of his leisure in even moderate cultivation of his intellectual and moral nature, he is the happiest man. Of the two extremes, the totally unemployed and the over-employed, I question whether the former has not the greatest number of unsatisfactory hours. The industrious artizan who by a moderate day's labour can well provide for his family, is one of the happiest members of society, as well

as one of the most useful. They would also be the most independent class if they husbanded their resources and made provision for the future, by more temperance in those useless and too often pernicious luxuries — tobacco, beer, and spirits." Sir John Forbes has also made some most excellent remarks on this subject in a lecture published by him, "On Happiness, in its Relations to Work and Knowledge," from which, however, it is difficult to make an extract, as the whole of it is equally pertinent to the subject.

32. THE SPORTS OF THE FIELD, or the carrying out of any other hobby, indulged in to a moderate degree, are in this country the main source of the healthy and robust frames of the middle and higher classes of society. Mere bodily exercise, without the accompaniment of some pleasurable excitement, does not seem to do much good in promoting health; but if an individual can only take a gun in his hand in pursuit of partridges or grouse, or will chase a butterfly, or peer into the recesses of stone quarries or of the seashore in search of geological or zoological specimens, as the case may be, he will find that he returns to his home refreshed and invigorated in mind, though still tired in body, but in such a way that the bow, after unstringing for a short time, recovers more than its wonted tone. This necessity for mental stimulus, as a part of healthful exercise, marks the difference between man and the brute creation, for these last can be kept in high health in perfect solitude; and provided they are well fed and properly exercised, even though alone, they will obtain all that is wanted by a mere muscular exertion, and are not dependent upon the same essentials as man. But even here, in order to produce the highest health, there is sometimes a necessity for extra stimulus; an example of which may be seen in training the racehorse, when another horse must be made to lead the gallops, or the horse in training will not, and possibly cannot, exert himself to advantage. So, again, in training man for pedestrian exercises, he must have a companion, and be amused by conversation as well as stimulated by competition, or he becomes flagged and dispirited by the amount of work which his condition requires. I would therefore earnestly counsel all those, whether male or female, whose occupation is not of a laborious nature, and who wish to enjoy good health (and this I suppose will include most of my readers), to adopt some out-of-door pursuit. It matters little whether it is hunting, or shooting, or coursing, or geology, or zoology, or entomology for the male sex, or riding, or any of the "ologies" for the more delicate portion of creation. Any of these will give occasion for muscular exercise, and add the zest to it which is required in order to produce the good effect.

33. MENTAL OCCUPATION, on the other hand, *as a relaxation*, is altogether suited to the laborious artizan; but let him, if possible, pursue it in the free air of heaven, and in as open a situation as possible. The man who has been working for ten hours in a crowded workshop or factory needs no more absolute muscular action than is necessary to convey his body to a fresh and healthy air; but this he does require; and no "Free Library" or "Literary Institute" will give him what he wants so well as an open common or park. Here, on most summer evenings, he can take his book and occupy his mind to advantage, while he refreshes his lungs and purifies his blood. Such are the laws of nature, and her demands must be complied with, if health and happiness are to be obtained in this world.

CHAP. III.

ON THE MAINTENANCE OF HEALTH BY INTERNAL MEANS.

SECT. 1.—USE AND EFFECTS OF FOOD.

34. By a reference to the physiology of the organs of digestion, it will be seen that the use of food is to supply the kind of material which is required for the growth and subsequent support of the body. It will, therefore, only be necessary in this place to enumerate the various kinds of food which are useful in supporting health, as well as the few medicines which may be considered almost necessary in our artificial condition to prevent its loss.

SECT. 2.—SOLID FOOD, AS TAKEN IN A STATE OF HEALTH.

35. It has already been remarked, that health is comparative, and that few people are blessed with a superlative share of this blessing. Strong food, therefore, which is fit for one end of the chain is too much for the other; and the delicate stomach, even if possessed by a person in fair health, will refuse to digest many articles which are suited to the ploughman or even the robust patrician. The old adage, that "What is one man's meat is another man's poison," is true to the letter; and we must consider this fact in endeavouring to lay down rules for the proper ordering of the diet of people in health. Again, it does not follow, that because chemical theory tells us that two substances are composed exactly of the same elementary substances in equal proportions, that therefore they shall be equally digestible. On the contrary, it is found that in many cases two such articles may be found, one of which is particularly light and wholesome, while the other is heavy, gross, and indigestible. But, taking theory as supported by experience for our guide, we must come to the conclusion that certain substances are better fitted than others to support health and strength, though in particular cases there are many exceptions. In man a mixture of animal and vegetable food is found to answer the best, though either alone will support life. The "vegetarians" contend that flesh is prejudicial; but if so, why are teeth calculated for its division given to man? and why is it found that a proper quantity improves his health and strength? Nature teaches man to supply his wants in the best way of which he is capable, and in a state of nature he is a hunter and fisher, and not to any extent a tiller of the ground. Roots and fruits, as they grow without assistance from him, are often sought out and eaten; but it is never found that the savage will take the trouble to obtain them which he will do in pursuit of game. Among the half-civilized nations of warm climates, the cereals, including wheat, maize, oats, barley, rye, and rice, and sometimes potatoes, form the staple food, and often with a very slight admixture of milk or butter, as in the case of the inhabitants of our Indian Empire. Indeed, with the addition of butter or milk, any of the above materials will serve the purposes of life, even in our colder latitudes; but a much larger quantity must be consumed than is sufficient with a proper admixture of nitrogenous materials. In cold climates, again, oil and fat compose the chief articles of diet; and it is said that the Esquimaux will consume from twenty to thirty pounds of oil at a meal.

36. MINERAL and LIQUID ELEMENTS are also required, chiefly contained in the vegetables which are conducive to health, as well as in the pure water which nature everywhere presents to man's use.

37. AS REGARDS SOLID FOOD, it will therefore be found that in health man can best be supported upon certain proportions of animal food, bread of some kind, and vegetables; the amount of each being in proportion to the nature and extent of the work done by him. If more than the proper quantity of either, or all, is taken into the

stomach, disease to some extent is almost sure to be produced; while if the supply is insufficient, the body is not properly nourished, and its organs refuse to perform their allotted work. The appetite is not always to be allowed to settle the point, because it is found that by those who indulge it to the full extent more food is often taken than the real wants of the system demand. Hence, it becomes desirable to ascertain what quantity and quality of food a healthy individual will require. We will, therefore, first take the best kind of food as the standard, and reduce some others to the equivalent weight.

38. A HEALTHY MAN TAKING ORDINARY EXERCISE may be considered to consume daily as follows of solid food:—

Meat (uncooked)	¾ lb.
Bread	¾ lb.
Potatoes or other vegetables	1½ lb.
Cheese	2 oz.
Butter	1 oz.
Milk	2 oz.
Sugar	1 oz.
Tea	½ oz.
Or Coffee	1 oz.

This is a liberal diet, and will serve for a healthy adult male, independently of all allowances for change and for accidental circumstances. But it is far better, instead of giving the above quantity of meat in all cases, to change a part of it for an equivalent in fish, or the bread or potatoes for pudding. Indeed, nothing favours health and digestion more than a variety in food, which is not certainly needed by the laborious artizan or field-labourer; but to those who do not give their bodies quite as much employment as their minds, the matter is vitally necessary. For females a considerably less amount will suffice; but here, also, much depends on their occupation, for those of their sex who indulge in strong exercise must feed themselves nearly to the extent indicated above, while the indolent will scarcely manage to digest one-half without feeling overdone.

39. THE SMALLEST AMOUNT OF CHEAP FOOD which may be considered sufficient to support a healthy man in good work in this country is as follows:—

Bread	1 lb.
Potatoes	2 lb.
Peas or beans	4 oz.
Dripping or lard	4 oz.
Cabbage or greens . . .	1 lb.
Cheese	3 oz.

This quantity, if properly managed and cooked, will suffice, and may be made tolerably palatable. The peas or beans should be boiled, and then fried in part of the lard with the potatoes and cabbage; part of the bread is to be eaten with this, dividing the whole into two meals, and the remainder of the bread, with the cheese, will make a third meal. Of course this kind of diet will not do for those accustomed to fish, flesh, and fowl.

40. CHILDREN MAY BE FED on oatmeal porridge with great advantage. The following diet answers exceedingly well for those whose means are limited, but who desire to give their families a healthy species of food:—

Oatmeal (Scotch is the best)	¾ lb.
Potatoes and greens . .	1 lb.
Milk	1 pint.
Treacle	2 oz.
Bacon	2 oz.

The oatmeal should be boiled in water for about half-an-hour, or longer if very coarse; then add the milk; take it either hot or cold, and sweeten with the treacle. This serves for breakfast and supper, while the potatoes and bacon form the frugal but sufficient dinner.

41. From the calculations of Liebig, and other chemists, it is found that certain articles of diet contain varying combinations of the elementary substances—oxygen, hydrogen, nitrogen, and carbon; and that these are required in certain definite proportions to support life under the varying circumstances attending upon the climates, occupations, and habits of the different races of mankind. If, therefore, we should find that in all cases these chemical calculations are correct when carried out in practice, we only have to

get the standard as above, and reduce all other kinds of food by chemical examination to the same amount of the required elements. But though in the main these observations of the chemists are founded in fact, yet the exceptions are very numerous, and sufficient to prevent our relying upon them without the test of experience. Thus, the composition of beans or peas is very nearly identical with beef or mutton, and yet no one but a "Vegetarian" will maintain that they will support a man's health and strength in the same degree. In round numbers, 5 lb. of rice, 4 lb. of potatoes, 1¾ lb. of wheat-flour, or 2 lb. of bread or oatmeal, may be considered equivalent to 1½ lb. of beef or mutton, of the average degree of fatness in this country, in producing muscle. Hence it follows, that if it is desired to increase or diminish any of the above principal articles, the change must be made on the above calculation. Thus, suppose it is found impracticable to supply three-quarters of a pound of meat, or that this quantity is too much for a peculiar stomach, then, if it is desired to replace it by bread—as 1 lb. of meat is equivalent to 2 lb. of bread, the displaced quantity of the former must be replaced by double its weight of the latter; or if the vegetables are desired to be substituted, then three or four times the weight of the rejected meat must be added in its place.

42. The Mineral Elements of Food must not be forgotten. These, as will be seen on referring to the article "Food," are chiefly contained in the vegetables forming part of our diet; but a large amount also exists in the juice of the flesh, and hence this should always come to table in some form or other. Soups and gravies contain these ingredients, and in all cases they are at times desirable in health, though somewhat difficult of digestion to a weakly stomach. The alkalies contained in the meat we live upon are largely extracted in boiling; and the broth so obtained should be made into soup, unless a substitute is found in the shape of soups obtained expressly from other meat, and then of course the boilings may be devoted to the poor.

43. Excess in Quality and Quantity of Food alike produce disease, and should equally be avoided. Thus, meat in itself is wholesome and invigorating when mixed with vegetable food in proper proportions, but if eaten by itself, and especially if increased in strength by boiling down to a soup or jelly, it becomes too concentrated, and inevitably soon disagrees. The same is the case with rich creams, eggs when eaten alone, and other highly nutritious substances. With regard to quantity, if the stomach has more food put into it than its powers will enable it to digest, part must be left to ferment, or will be passed off by purging, or rejected by vomiting, all of which occasion distress to the stomach and to the whole system. Or, if the mischief is just short of these decided rebellions, then the food, when only half prepared and digested, is absorbed into the system, and thus leads to a double allowance of work for those organs, which are used to purify and still further prepare it for the purposes of the system. The chief error in this country lies in the excessive eating of stimulating food, such as flesh or wheat-meal, which occasion too much work for the liver, and lead to dyspepsia, with its attendant evils, constipation and hypochondriacism.

Sect. 3.—Liquid Food.

44. Liquids of some kind are no less necessary than solids for the support of the body, and the natural appetite for them, known as "thirst," is even more peremptory than hunger. Liquids, as used in this country, may be considered as consisting of four kinds: 1st, the simply diluent; 2nd, the nourishing; 3rd, the stimulating; and, 4th, those containing a peculiarly conservative principle, similar to *theine*.

45. Diluent Drinks all depend upon water for their useful material, together with, in many, a flavouring addition. Nature, in her workship, makes use of water as the vehicle for conveying most of the useful substances necessary for building up the body to and from their several destinations. As large quantities are constantly being carried off

by the secretions, so a liberal supply must be afforded; and there is no doubt that for a continuance of good health fluids must be passed into the stomach, containing water as the principal source of their utility.

46. NOURISHING DRINKS are not by any means a necessary of adult life, but for the infant stomach they are indispensable, and chiefly in the form of milk or some substitute for it, such as gruel, pap, &c.

47. THE NECESSITY, OR OTHERWISE, FOR THE USE OF STIMULATING LIQUIDS is one of the great controversies of the present day. No one can dispute the fact, that in certain states of the system they are useful, and especially in the cure of disease, and the removal of the depression caused by severe bodily and mental labour. But, at the same time, it cannot be denied that their abuse leads to evils of a horrible character, which it would be well for the happiness of the world to get rid of by almost any means. The great mischief attendant upon ardent spirits should perhaps induce us to forbid their employment, since they are seldom required without the large admixture of water with them. When this has been made, brandy and water or gin and water may be considered as wholesome as wine or beer; but the misfortune is, that spirit drinkers begin by the use of spirit and water, and end by confining themselves to the former, with either none, or very little of, the latter. Beer or wine is not so liable to abuse; and it appears that drunkenness is far more rare in wine-growing countries than in those where whisky and gin are obtained with an equal degree of facility. These, however, are questions of state necessity, and scarcely fitted for a book like the present. Though fermented liquors contain a considerable proportion of the elementary substances necessary for the support of the body, yet they appear to be chiefly useful in giving tone to the stomach, and enabling it to extract nourishment from its more solid food. Where digestion is good their employment is not required, and more especially in childhood and the earlier years of life. In old age, and in those who are compelled by the artificial state of our society to endure long-continued mental or bodily toil, they are often a great boon; but their use should be husbanded for the day when they are absolutely demanded by the wants of the system. Most healthy men will go through an average day's work much better on good useful solid food, with water and tea or coffee, than if joined with beer or spirit; and there is no doubt that health is maintained under such circumstances, while the *removal of disease, when it does attack such men, is far more rapidly and easily accomplished.* This last fact is well known to all medical men of experience, and speaks much for the advantages of water drinking. Much harm is no doubt done by the attempt to *compel* men to leave off their usual habits, for no one likes to be driven into good behaviour, but every year the people find more and more the evils of intemperance, and it is to be hoped that they will themselves see the necessity for reforming their habits. It is not, however, by any government enactment that this good can be done, for if the resolution to avoid intoxication does not come from within and arise from a sense of its folly and wickedness. the chief advantage attending upon the change is lost, and the character, instead of being improved, is only made more childlike and dependent upon others for support.

48. THE USE OF TEA, COFFEE, AND COCOA has of late years rapidly increased in this country; and as they all contain a nearly similar principle, acting in the same way on the system, they may be considered as only different forms of the same class of liquids. It appears that *theine*, *caffeine*, *theobromine*, *piperine*, and it is said the active principle of tobacco also, have all the property of arresting for a time any undue progress of excretion or wasting of the animal tissues, which goes on during and after active exercise, either of the bodily or mental powers. Hence, any of the articles containing these substances are highly valuable to the over-wrought body, including the brain among the organs which are specially

indebted for conservation. The waste alluded to above does not immediately cease when the necessity for it has been for a time suspended until some of the above substances exercise their power; and thus while alcohol in its various forms supplies the materials which are demanded, tea or coffee will check the necessity for them. Nothing is more refreshing to the careworn man than one or other of these liquids administered directly after his toil has ceased; and probably even during work the powers are considerably husbanded by their imbibition in moderate quantities. It is asserted, and I believe with truth, that no nation which has ever commenced their use has afterwards given them up, and this can only depend upon their recognised utility, since the taste for them is acquired, and not natural, and dependent rather upon the effect produced than upon the gratification of the appetite or palate. As in all other cases, tea or coffee may be taken in excess, and then they certainly do harm; but one or two cups of good black tea will seldom be otherwise than beneficial to the man in ordinary health, invigorating the body and mind, and enabling an amount of work to be got through which would otherwise make severe inroads on the constitution.

SECT. 4.—INVALID DIET.

49. Foods, useful both in health and in disease, are alike in the principles upon which they are employed, but not in the practical details. The various kinds, however, differ so greatly that they can scarcely be advantageously considered here. Indeed it will be found that few rules can be laid down, almost every case requiring a different treatment in this and in most other respects. Fashion has always interfered greatly in advocating particular modes and kinds of invalid diet: sometimes bread and mutton chops being the constant prescription, and at others all the delicacies of the season being in turn recommended. As a general rule, however, it may be said that the acute cases of disease will be benefited by what are commonly called "slops," while the ordinary run of chronic cases require merely a plain diet of roast and boiled, in moderate quantities, and at *regular intervals* of four or five hours through the day. Roast and boiled mutton, or chops of that meat, or of lamb, will generally agree with the invalid; or plain white fish, such as soles, whiting, cod-fish, or even turbot. Plain puddings, such as those of bread or rice, with or without the ordinary fruits, will generally be borne; but rich puddings and creams, or those made with suet, and pastry of all kinds, can scarcely ever be eaten with impunity by the invalid. For further information on this subject, see *Nursery Diet*, and the various directions for the treatment of disease.

SECT. 5.—MEDICINES USED AS A MEANS OF PROMOTING HEALTH.

50. In a state of nature no kind of medicine would ever be required, unless any absolute disease or accident occurred to call imperatively for its use. But in our present condition of civilization, and especially in this country where our occupations often lead to sedentary lives, while our food is not of a character to suit them, some precaution must often be taken against the ill effects of such bad management. For instance, constipation is so common in this country, even among those in comparative health, that it has become a national evil, and has led to the enormous supplies of Parr's Pills, Widow Welch's Pills, and innumerable others, which are sold by the hundred pound's worth at a time to the dealers in such remedies. Many of them are common and tolerably innocent aperients; others are more injurious; but the whole bear testimony to our demand for some such class of remedies. Part of the necessity for aperients arises from the bad management of our early lives, when calomel, or scammony, or senna-tea has been the constant ministrant attending upon fractiousness or ill-temper, without any regard to the foundation which has thus been laid for future miseries. It may therefore be laid down as a rule, that with many of us aperients of some

kind or other are required to maintain health, and the only question arises as to the kind which shall be employed. Beyond this I scarcely think that medicine can be called in to aid the body in preserving its health, for all other conditions requiring drugs may be set down as absolute disease, or disorder of some organ. Constipation, it is true, is in theory a disorder of the bowels; but it is compatible with ordinary health, and so common to one half the population of this country, that it may well be considered an exception to the rule. The drugs useful in removing it may be found under the head of *Aperients, and their Use.*

BOOK II.

THE ELEMENTARY FORMS OF DISEASE, THEIR CAUSES AND SYMPTOMS.

CHAP. I.—NOMENCLATURE AND CLASSIFICATION OF DISEASES.

SECT. 1.—NECESSITY FOR THE NOMENCLATURE OF DISEASES.

51. Disease has already been defined as a departure from health, but this is not all that is necessary in order to enable us to remove it. We find by experience that, in certain instances, a disease is capable of being cured by particular means, which in others would be useless or injurious, and, therefore, it becomes necessary to distinguish between the two. For this purpose certain signs or symptoms, as they are called in medical phraseology, are watched and noted down; and a particular disease, which exhibits a certain set or combination of symptoms, whenever it shows itself, receives a definite name, by which it may always be alluded to. There is no doubt that this subdivision into classes, orders, and varieties of disease is wholly artificial; and that though a description may serve exactly to define any one attack which has come under the observation of the writer, yet that it will not always serve for the future, but that in some trifling matters there will be a want of uniformity and exactness. Still, in the main, the observations of accurate physicians for many centuries confirm us in imagining that the classification made many years ago is also applicable at the present time, though we find that in detail the forms vary a good deal, and the more we attempt to divide and sub-divide, the more difficult becomes the task. Every one who has endeavoured for himself to discover the nature of any particular disease, must have been often struck with the addition of fresh symptoms, or the absence of others, which are recognised as the usual accompaniments of the one he is examining. This is very puzzling to the beginner, and it is necessary for him to know the fact, or he will often be at a loss when the more experienced practitioner would be able to set him right easily. If, therefore, in all but some trifling particular, any description exactly tallies with the symptoms presented to the observer, he may rest contented and act upon the supposition that what he sees before him is a combination agreeing sufficiently for all useful purposes with the recognised form as described. Every known or described disease should be considered as presenting a set of symptoms, almost invariable in their nature, which constitute what is called "the type" of that disease, while, in addition, others are constantly showing themselves under some circumstances, and absenting themselves in others; and these are said to be the "complementary signs, or symptoms."

SECT. 2.—THE PLAN OF NOMENCLATURE.

52. Next, it has been thought important to give names to diseases which shall convey to the initiated some idea of their nature, and in as concise a form as possible. This may or may not be desirable; but, in any case, it is the fact that the attempt has been made, and that to the present day it is still carried out. In many instances the convenience is great; as where an organ is composed of several parts, subject to varying conditions, that require a different treatment. For instance, in the inflammation of several organs the nature of the treatment would be quite dependent upon the part of the organ attacked; and though it is seldom that the distinction is as defined as theory would lead us to

believe, yet it really extends far enough to be of use in practice. Hence, when we have either of the three structures composing the lungs attacked by inflammation, instead of saying that there is inflammation of the pleura, or of the substance of the lungs, or of the mucous membrane lining them, we say that we have an attack of pleurisy, peripneumony, or bronchitis, according to the part which may be the seat of the attack. To this there can be little objection, though the use is not very obvious; but when, beyond this, we attempt to give a name which, while it pretends to describe the disease, really has no such result, we are only stultifying ourselves, and instead of doing good, we are slurring over our want of knowledge. Thus, every one is fond of talking, in the present day, of "neuralgia," and trying to account for painful sensations by saying that neuralgia is the nature of the disease, with which explanation many people, no doubt, are well satisfied, although they at last only know what was already forced upon them, namely, that they have a local pain, without any other attendant symptoms. Still, the word "neuralgia" is convenient, because it saves a good deal of description; and if those who use it would not attempt to conceal their ignorance of the seat of the disease, they are quite at liberty to continue its employment. When names are given in accordance with some one pre-eminent symptom, there is no cause whatever for complaint; and perhaps this is the least objectionable mode of all. Thus, fever means only "burning," and we all know the universality of that sensation; but inflammation means the same thing, or, perhaps, an additional degree of heat or "flaming;" and yet in many cases we have no such sensation, and though the heat is really increased, there is no knowledge of its being so on the part of the patient. Thus, we find a want of consistency in nomenclature which is very tantalizing to the student; but, after a time, he contents himself by accepting the names which are given as being attached arbitrarily to certain groups of symptoms, and the division being useful for his purpose, he does not care that it should be scientifically correct, or that in all cases the meaning of the word used should embrace the definition of the disease. So many attempts have been made to improve our nomenclature without much success, that there appears to be an insuperable difficulty, and the best plan appears to be to recollect that, after all, the alteration of a name does not affect the symptoms with which it is connected.

SECT. 3.—NOSOLOGY, OR CLASSIFICATION INTO GROUPS.

53. From the earliest days attempts have been made to classify diseases upon some basis or plan which shall settle all in their respective places, but no one yet has succeeded at all satisfactorily, and for this plain reason that nature has not done the work for us. We find no difficulty whatever in dividing the whole world into animals, vegetables, and minerals, because such is really the law of the universe; but it is not so when we begin to arrange what is not so defined, and we can then only have recourse to our own finite wisdom, and here we are continually breaking down. The unprofessional student of disease may therefore at once dismiss from his mind all attempt at mastering the various systems of nosology, which have been published by Cullen, Mason Good, and others, and content himself with arriving at a knowledge, 1st, of the meaning of the word *fever*, and of the symptoms of the various forms of disease which bear its name; 2nd, of *congestion*, in its many protean forms; 3rd, of *inflammation*, which is still more complex; and, 4th, of the fact that all other diseases consist in a *depraved condition of the solids or fluids of the body*, though split up into an immense number, known as *nervous diseases*, *stomach* and *liver complaints*, *blood diseases*, *parasitic diseases*, *malignant diseases*, and those derived from our parents, and commonly known as *hereditary*.

CHAP. II.

THE CAUSES AND SYMPTOMS OF DISEASE.

SECT. 1.—CAUSE OF DISEASE.

54. In medical writings we find a great deal said of the necessity for getting at the cause of the disease before it can be removed; but this is often a fallacy, though there is no doubt that it is desirable to obtain a full knowledge in each case of everything connected with it. But it often happens that something more is necessary than the removal of the cause before the effect will cease, and this should be impressed upon the observer, or he will content himself with performing only a part of his work. It is true, that in some acute cases the removal of the cause ensures the cessation of the effect, as when an unwholesome food is disagreeing with a child's stomach and an emetic is given, the relief afforded is magical, and nothing more is required to be done. But suppose a thorn has penetrated the skin and caused matter to form, the removal of the thorn will not get rid of the matter, but some further steps must be taken to rid the skin of its presence.

55. Causes, again, are subdivided, in professional language, into *proximate* and *remote*; or, by some writers, into *predisposing* and *exciting*; or by others, again, into *primary* and *secondary*. Much confusion has arisen in consequence of the various significations which have been given to these terms, but for all useful purposes the terms predisposing and exciting, or primary and secondary, may be considered to mean the same. But here it is very difficult to define exactly what shall be considered predisposing and what exciting causes, since the same thing is very often both the one and the other in general as well as particular instances. Sudden alternations of temperature, for instance, often weaken the body and render it predisposed to disease, which is finally excited by one more sudden than usual, and which brings on actual inflammation of a tubercular lung.

SECT. 2.—SYMPTOMS, AND THEIR PROPER INTERPRETATION.

56. A disease being made up of symptoms, and a knowledge of these leading to its proper treatment, if a correct interpretation of them is made, it becomes necessary to study them carefully with that object in view. They are of use—1st, *to distinguish a disease from all others*, so as to be enabled to arrive at its treatment; 2nd, to obtain a knowledge of its comparative severity, and thus to *foretel* the result. Together they lead to what are called the *diagnosis* and *prognosis* of the disease.

57. THE DIAGNOSIS depends on the result of the several modes of examination which may be put in force. Thus, when a patient complains of pain in the chest, the examiner proceeds to inquire whether the pain is internal or external, if the latter, whether it is increased by pressure or by moving the arms, and if the former, whether a deep inspiration will aggravate or remove it; then joining to these the state of the pulse, the appearance of the countenance, the presence or absence of fever, and the use of the stethoscope, if it has been acquired, the conclusion will be formed, either that some mischief is going on in the lungs or heart, or that some external and probably muscular pain has been experienced. This appears simple enough, and so it is to the experienced eye; but the tyro will often blunder and confound severe external pain, which is comparatively of no consequence, with pneumonia or pleurisy, diseases requiring active general treatment. But the mistake could never be made if the mind of the observer had grasped the whole group of symptoms which belong to the several diseases, for he would at once have observed, in either case, the absence or presence of those which would have instructed him correctly. Experience in most

Instances will alone give this cool power of appreciating the value of symptoms, and few will be able to dispense with it. A Correct Prognosis depends upon the experience of the examiner, and upon his power of comparing the case before him with the others which he has seen or read of. It depends upon observation almost alone.

58. Beyond careful observation and comparison, nothing is required for the detection of disease, excepting in some few cases, when a knowledge of minute anatomy is indispensable. It is a common subject of congratulation in the medical profession that, with their knowledge of the structure of the frame, they must be able to master the *arcana* of medicine better than those who have not gone through the interesting study of the mechanism of the human body. But I have no hesitation in saying, that I fully believe this to be a fallacy, and that it is only to the pioneer or discoverer of new theories and modes of treatment that this knowledge is very important. Those who are content to follow in the footsteps of other observers derive no benefit in their treatment of disease from a knowledge of its precise seat and nature; and hence it is often considered paradoxical, though not really so, that the best anatomists are not by any means the best physicians. Men who have spent their early years in investigating the precise essence of disease as exhibited after death, and in unravelling the elementary composition of the various tissues, place too much dependence on their knowledge, and are too apt to neglect the careful noting of symptoms, and of external appearances, which tend far more to aid the physician than does a knowledge of diseased structure, the nature of which he has first to detect. I am well aware that a minute knowledge of structural changes will often lead to discoveries of modes of treatment which may not be otherwise thought of, but this is not what I mean. On the contrary, it is obvious enough that, when a careful observation of appearances leads one to suppose that a disease is existing which has been previously detected and cured by certain means, all that is wanted is obtained, and it is of little use to be able to analyse its intimate nature, or the structural changes which may accompany it. My readers need not, therefore, be discouraged by a feeling of positive deficiency for the task they are undertaking; and it is notorious that few good practitioners have ever kept up their anatomical knowledge beyond their pupilhood. One great use of information of all kinds is to show the extent of one's ignorance, and this is really, as far as medicine goes, the great advantage of anatomical science. It must however be remembered, that here I am writing for the benefit of the non-professional only, and that I am not contending that the medical man himself will find no use for his anatomy. In surgery, and in some obscure cases, he must have it ready for his call; and without a full knowledge of the human body, he will be constantly fancying that he may meet with some case which will expose his ignorance: so that he should, by all means, obtain and keep up such an acquaintance with the science as will place him at his ease in all cases, and will enable him to verify the accuracy of his diagnosis in fatal cases by a *post mortem* examination of the diseased structure. My object here is to show the uninitiated that he may venture to form an opinion on most medical cases just as well without anatomy as with it, and that his success or failure will depend upon his experience in medicine alone, and upon his fitness for his task, and will in no wise be measured by any other standard.

CHAPTER III.

FEVER.

SECT. 1.—CHARACTERISTICS OF FEVER.

59. When an individual, at any period of life, complains of languor, weakness, and loss of appetite, following shivering, and accompanied by more or less increased heat of skin and freqnency of the pulse, together with a general disturbance of the functions of the body, he is said to have "fever" in some shape; and in common language, when these symptoms are of a marked character, and are not dependent upon local disease or inflammation, the attack is denominated "a fever," which may be one of several types, known as *typhus fever*, *ephemeral fever*, *intermittent* or *remittent fever*, &c.

60. Fever, or the collection of symptoms given above, is therefore either attendant upon other and more marked diseases, or it is a disease in itself; but in either case it appears to be an effort of the natural powers to get rid of some offending matter which is present, or to repair an injury which has been done. Thus, a poison has been imbibed in some marshy district, of the nature of which we know nothing but by its effects, and this poison would depress the powers of the system, and probably lead to organic mischief in important organs, but the repairing hand of nature lights up the flame, which ends in ushering in a well-marked series of symptoms called *intermitting fever*, and which, by alternate flushings and sweatings, have a tendency to carry off the poison; and if the further access of fresh *malaria* is prevented, in all probability have that effect. The same is the case with the result of accidents, or the contagion of scarlet fever or measles, but that here the fever is more violent, and is evidently carried so far as often to endanger the life of the individual. Nevertheless, in all cases fever may be said to be an action set up to get rid of offending matter, and the greater the load of work which is to be executed, the more severe is the fever, and the more dangerous the result.

SECTION 2.—VARIETIES OF FEVER.

61. FEVERS ARE CLASSED variously, according to the symptoms they present, or the causes which produce them. The most useful division for all practical purposes is into two great divisions, namely—1st, true fevers; and, 2nd, febrile diseases, accompanied with more important local inflammations, which latter division may, therefore, better be described in conjunction with the inflammation attending on them, the fever itself, in this case, being called symptomatic, while that forming the essence of true fever is called idiopathic. Leaving, therefore, out of consideration all this second division, idiopathic fevers may be classed as follows:—

1. CONTINUED—
    - *a.* Simple or ephemeral.
    - *b.* Complicated or typhoid.
2. PERIODIC—
    - *a.* Intermittent (ague).
    - *b.* Remittent.
3. ERUPTIVE—
    - *a.* Variolous (small-pox, cow-pox, &c.)
    - *b.* Chicken-pox.
    - *c.* Measles.
    - *d.* Scarlet fever.
    - *e.* Plague.
    - *f.* Miliary fever.

CHAP. IV.

CONTINUED FEVERS.

62. DEFINITION.—This kind of fever is characterized by the general symptoms of fever, including shivering, weakness, thirst, increased heat and pulse, and disturbance of functions, without well-marked remissions, or primary local disorder.

63. THE VARIETIES are chiefly two—1st, *simple;* and, 2nd, *complicated;* the latter being generally epidemic, and the two running into one another, according to the nature and severity of the symptoms, so that it is often at first difficult to say to which of these divisions any particular attack will ultimately belong.

SECT. 1.—SIMPLE FEVER.

64. SIMPLE CONTINUED FEVER (otherwise named *common fever* and *ephemeral fever*) is a continued fever composed of the symptoms detailed at par. 62, but slight in degree and of short duration. Its average extent is about three days, but it often runs its course in half that time. THE PRECISE SYMPTOMS are usually slight shivering with pains in the limbs and back, chilliness, loss of appetite, disagreeable clammy taste in the mouth, with furred tongue, not dry, and not much thirst, hot skin, headache, and frequent pulse. After from twenty-four to forty-eight hours, perspiration generally comes on and relieves the patient, leaving him only slightly weakened by the attack. It is often followed by cough, or what is called "a cold," by which is meant a discharge from the nose. THE CAUSE is generally exposure to a draught of cold air, especially after fatigue. Contagion will also have the effect of establishing the disease, either produced by another case of similar character but of unusual intensity, or by an attack of typhus fever.

SECT. 2.—COMPLICATED CONTINUED FEVER, OR TYPHUS.

65. COMPLICATED CONTINUED FEVER (called also *typhus*, *typhoid*, *low*, *putrid*, *nervous*, *bilious*, *gastric*, *spotted*, *gaol*, and *hospital fever*) is a fever with like symptoms to the preceding, but extending to a greater length, and being of much greater intensity and virulence. The various names enumerated above have been given to it by different writers according to the views of each as to its cause or essence. Thus, as there is generally more or less disturbance of the functions of the brain, it is called typhus, the word in Greek meaning *stupor;* so from its producing extreme prostration it is called by others *low;* and from its tendency to allow of decomposition of the tissues, in consequence of the low degree of vitality which exists, others have denominated it *putrid*. In various epidemics there is a tendency to attack some particular organ, which may be the brain, and then the term typhus is more particularly applicable; or it may be the stomach and bowels, and then there is every reason to apply the name *bilious* or *gastric;* or, lastly, peculiar dark spots, called *petechiæ*, may be almost invariably present, and then we are told that the disease ought to be denominated *spotted* or *petechial*. It is therefore well to know, that when we meet with any of the above terms as applied to fever, the disease is really that which we are now considering, but that the peculiar epidemic type which is prevalent is characterised by the prominence of the symptom more immediately connected with the term which is used.

66. THE SYMPTOMS of typhus fever, by which name this disease is most generally known, are very varied in their character, and depend greatly upon the stage at which it is examined. Its course may be divided into three nearly equal stages, varying a good deal in total length, but when well developed usually extending to twenty-one days, so that each stage may be said to comprise seven. These stages are—1st, the *incipient* or *premonitory period;* 2nd, the *period of reaction;*

3rd, the *typhoid stage;* after all which comes the stage of convalescence.

67. THE PREMONITORY OR INCIPIENT STAGE of typhus fever is very variable in its nature and degree, depending much upon the strength of the constitution attacked, and still more upon the severity and kind of epidemic. It may be very sudden and severe, or it may be so gradual as almost to escape observation until thoroughly matured. If the former, there are generally severe shivering fits, with violent headache, loss of sleep, extreme restlessness, incapacity for exertion, either mental or bodily, and a great tendency to unsteadiness or trembling of the muscles, so that walking is unpleasant, and the tongue when put out for inspection is tremulous in a marked degree. The feverish symptoms are not very evident in point of heat of skin, or quickness or power of pulse; but here there is great difference in different cases. In most instances the countenance is anxious, somewhat pale and shrunk, and the breath is unpleasant in smell. In the more insidious attacks there are seldom shiverings, and often nothing evident to a common observer but a slight loss of appetite and strength, which is often referred to a disorder of the digestive organs. If, however, there is an epidemic prevalent, and a member of a family between the ages of ten and thirty is complaining of general uneasiness and loss of strength and spirits, with a pale trembling tongue, gradual loss of appetite, *sleepless nights*, accompanied by great restlessness, it may generally be suspected that an attack of typhus fever is impending.

68. In the next stage, or that of REACTION, there is more or less tendency to congestion, or inflammation of some one or more organs. The feverish symptoms are more marked, the skin being hotter, especially at night, the pulse more frequent, thirst becomes developed, there is headache and other symptoms of increased action in the circulation through the brain, namely, flushing of the face, throbbing of the arteries of the head, suffusion of the red vessels of the eyes, and a great tendency to delirium, without any refreshing sleep. Sometimes the brain continues almost free, but generally there is more or less disturbance of its functions, with torpor of the whole nervous system. During the early part of this stage the tongue is gradually coated with a yellowish moist fur, which gradually becomes brown and dry down the middle, and towards the last is covered with a hard and parched brown coating. Together with these symptoms, which are almost invariable, there generally occurs some complication, consisting in a congestion or inflammation of the brain, or lungs or bowels; and in most severe cases there is also an eruption of the skin, characterised by spots of a bluish red colour, which appear to be caused by the rupture of the small vessels of the skin. If the brain is the seat of complication the delirium is unusually high, with great suffusion of the eyes, heat of scalp, and disturbance of the nervous system. When the chest is affected there is rapid and difficult breathing, cough, and all the peculiar signs of inflammation or congestion of the mucous membrane of the lungs, or of their substance; and if the stomach and bowels constitute the seat of complication there is diarrhœa, with painful distension of the bowels by wind. The motions are at first yellow, but soon become black and pitchy, and in bad cases there is often severe hemorrhage, sometimes of such a nature as to carry off the patient rapidly; and the evacuations varying in appearance from the colour of blood to that of coffee grounds or pitch.

69. THE TYPHOID STAGE is the most marked of all, the muscular strength being almost entirely gone, and the mind and senses in abeyance. The patient lies helpless on his back, his mouth open, and he is possessed with a peculiar tendency to travel downwards towards the bottom of the bed. This last is not merely from weakness, for if that alone were the cause the body would remain at the lowest part, but if the foot is raised the patient will still continue to slip out at that part if his legs are directed that way, so that it

may be considered as of a different character to debility, though attended always by a fearful amount of it. There is more or less catching of the limbs, and in bad cases a picking of the bed-clothes. The pulse becomes very frequent, but feeble; brown fur collects about the teeth and lips, called *sordes*. The *fæces* pass involuntarily, the urine is either retained or dribbles away involuntarily, and the respiration becomes very hurried and irregular. After the continuance for some days of this severe condition of the symptoms, they are either mitigated in severity—generally following a refreshing sleep and profuse perspiration—or they go on to exhaust the patient, who either dies worn out, or from mischief in the brain, or suffocated by effusion of mucus in the air tubes, constituting what is known as the "death-rattle."

70. The Causes of typhus fever are either contagion, emanating from a previously existing case of a similar character, or the *miasma* arising from foul drains or overcrowded and filthy habitations. These, however, require for their development a state of the body which will receive and ferment the poison; and such generally consists in over-fatigue of body or mind, depression of mind, and especially from fear of contagion, bad living, intemperance, exposure to cold, causing simple fever in a predisposed body, overcrowding of families in confined situations, and, in fact, anything tending to lower the general health.

71. The Contagiousness of typhus fever is a point which has been much discussed, and some people are still of opinion that it is not capable of being so propagated; but the balance of testimony is, in my opinion, strongly in favour of its communicability in this way, and to all persons who are submitted to its action under circumstances favourable to its absorption and development (see *Contagion*). It appears, however, to be in the highest degree probable that the infection is not very virulent—that is to say, that there must be the presence of the poison in a concentrated form in order to its being conveyed to another party. If, therefore, due cleanliness and purification by ventilation and other recognised means are employed in the apartments of those who are attacked with this fever, and if the health of the attendants is properly supported by good food, there is every reason to believe that the spread of the disease may be prevented. The existence of other diseases prevents its being taken by those who are possessed with them; and for this reason, in addition to the superior ventilation, &c., of hospitals, it is very rare that fever spreads in their wards, if the cases are scattered thinly among the general patients. The sexes are almost equally liable to its attacks, but age has much effect in resisting its inroads. Thus, in an epidemic at Glasgow, in 1836, it was found that of the population living at the respective ages mentioned—

	Years.	There were attacked
Between	5 and 10	1 in 134
,,	10 ,, 15	1 ,, 66
,,	15 ,, 20	1 ,, 41
,,	20 ,, 30	1 ,, 53
,,	30 ,, 40	1 ,, 85
,,	40 ,, 50	1 ,, 140
,,	50 ,, 60	1 ,, 271
Above	60	1 ,, 929

72. The Mortality also, which may be set down as about 10 per cent. for all ages, fluctuates greatly according to the age of each individual. In hospitals, where bad cases only are sent, and generally after great mismanagement in the early stage, the deaths are often 1 in 5 or 6; the average of the London Fever Hospital for a series of years being 1 in 6½. In this same hospital, of 500 cases of death, the numbers at each age were as follows—

Under 10 years of age, there died			14
Between	10 and 15 ..	,,	40
,,	15 and 20 ..	,,	118
,,	20 and 25 ..	,,	84
,,	25 and 30 ..	,,	73
,,	30 and 35 ..	,,	25
,,	35 and 40 ..	,,	39
,,	40 and 45 ..	,,	30
	Carry forward		423

		Brought forward	423
Between	45 and 50	there died	29
,,	50 and 55	.. ,,	14
,,	55 and 60	.. ,,	12
,,	60 and 65	.. ,,	6
,,	65 and 70	.. ,,	9
,,	70 and 75	.. ,,	5
,,	75 and 80	.. ,,	2
			500

73. **The Average Duration** of slight cases may be set down as from 3 to 10 days, and of severe cases of typhus at about 21 days. It has long been held that certain days are *critical*, that is to say, that on them there is a tendency of the disease to change for the better or the worse, and this doctrine is still held by close observers of the disease. Of 690 cases observed in the Edinburgh epidemic of 1819, a crisis occurred in 470 on critical days, which are the 3rd, 5th, 7th, 9th, 11th, 14th, 17th, and 20th. In addition, 52 crises occurred on what are called secondary critical days, which are the 4th and 6th; while 108 developed the crisis on the intervening or non-critical days.

74. **The Diagnosis** of this disease in the early stages is somewhat difficult, though when developed it is easy enough. It may, however, be known by the great degree of weakness and lassitude without corresponding apparent cause, and by the absence of any local disease in the early stages.

CHAP. V.

PERIODIC FEVERS.

75. **Periodic Fevers** are those which run no definite course as to duration, but which are relieved by more or less perfect intermissions or remissions of the disease, during which the patient is comparatively free. They are divided into *intermittents*, in which the interval allows the sufferer to feel comparatively well, and *remittents*, where the feverish symptoms decidedly abate, but do not altogether depart.

Sect. 1.—Intermittent Fever, or Ague.

76. **Ague** is characterised by the presence of distinct attacks of fever, each made up of a shivering stage, a hot stage, and a sweating stage, occurring at regular intervals, and followed by periods of entire cessation of the fever, so that the patient is able to go about his usual occupations. The varieties known among writers depend upon the frequency of the attack, which may be either *quotidian*, when it occurs once in 24 hours; or *tertian*, when it comes on every 48 hours; or *quartan*, when it visits the patient once in 72 hours. These often interchange, and there are other varieties which it is not necessary here to recapitulate.

77. **The Symptoms** of the paroxysm vary with the stage. Those of the cold stage are similar to those of the early period of simple fever, *but much more severe;* thus, the languor is greater, the headache is intense, the shivering is so great as to shake the bed or sofa, and no clothes or fire will give a feeling of warmth to the body. The pulse is small, and often irregular, but frequent; respiration quick, and the whole of the secretions suspended. After a time, this changes to the *hot stage*, when the body gradually becomes flushed, with a dry heat, the features being swollen, especially the nose and ears; the eyes are injected, and the pain in the head is very acute. The pulse becomes quicker, and is full and bounding. Thirst is developed to a most disagreeable extent, and the sensations generally are most uncomfortable. There is often in severe cases delirium or convulsions, but these do not usually occur except in very violent attacks.

Lastly, *the sweating stage* makes its appearance, a moisture first showing itself on the face and neck, and gradually spreading over the whole body, till there is a complete gush of liquid, which affords intense relief, lowering the standard of heat, and reducing the pulse to its usual level. The respiration becomes tranquil, and the head cool and free from pain. The urine passes more freely, but deposits a thick sediment, and the bowels are often relieved. The whole paroxysm, on the average, lasts about 7 or 8 hours, being more intense and of longer duration in proportion to the frequency of the attacks.

78. THE CAUSE of ague is always *marsh miasma*—that is to say, the emanations from decomposing vegetable matter, so that it does not follow that a marsh shall actually be present, but only that some dead vegetable matter shall have been submitted to the action of the air for some time, and its emanations not carried away. This cause produces certain effects upon the human body; but of their essence or precise nature we know little or nothing, in spite of all which has been written on the subject. Of one thing there seems to be little doubt—namely, that the *malaria* acts much the most energetically at night, and upon weakly persons, especially of the male sex, who are more subject to ague than females. Those also who have previously had ague are more prone to a second attack, which is very apt to come on from any other exciting cause besides *malaria*. Intermittents are often only partially developed, the cause producing headache or other local pain, together with languor and general feeling of illness, without the hot or sweating stage. This is called a masked intermittent, and very many cases of neuralgia, brow-ache especially, may be set down as belonging to this variety, where they come on at tolerably regular intervals, whatever the length of the intermission may be.

SECT. 2.—REMITTENT FEVERS.

79. REMITTENT FEVER differs from ague, in having only an imperfect remission of its symptoms, and no decided interval of rest from suffering. It may be considered as partaking of a middle character, between continued and intermitting fevers, comprehending some of the peculiarities of each. It varies much according to the age of the individual attacked, and may be conveniently described as—1st, *adult* remittent fever; and 2nd, *infantile remittent*, two very different diseases in their causes, symptoms, and treatment.

80. ADULT REMITTENT FEVER (sometimes called *gastric*, or *bilious*, or *yellow* fever) is not so common in this country as in warm climates, where it is often the most fatal and prevalent disease of the locality. It has received various denominations in different countries, depending a good deal upon the degree and severity of its symptoms. In this climate it presents the ordinary appearance of mild typhus, when accompanied with abdominal complications, and the same term (gastric fever) is applied by different writers to the two diseases, which, moreover, greatly resemble one another; the only difference being that in remittent fever the patient has a greater or less remission of the attack, and is able sometimes even to get about his business. Thus it often happens that in the same epidemic, part of the sufferers, if seen by a rigid nosologist, would be described as attacked with typhus fever, another part by gastric continued fever, and another by gastric remittent fever, though I fully believe the essence of the disease would in all be the same. In tropical climates the same disease becomes aggravated into the dreadful visitation known as YELLOW FEVER, which may be described as consisting of all the bad symptoms of typhus-fever, ague, and remittent fever thrown into one. On the other hand, this fever is modified by age, so far as to descend into the mild form of infantile remittent. Each of them, therefore, must be considered separately and described, since the course run is so different, though the cause is nearly alike in all.

81. THE ADULT REMITTENT FEVER of this country is generally preceded by some unpleasant sensations of the

stomach, with the listlessness, headache, and watchfulness which accompany all idiopathic fevers; the tongue becomes white and furred. There are no head symptoms, as in typhus, further than slight headache; the chief complication being either obstinate constipation or diarrhœa. There is generally nausea, and often vomiting, the matter brought up being either watery or mixed with bile. The urine is high-coloured, and deposits a large quantity of red sediment, and the thirst is considerable. After about twelve or fourteen hours these symptoms abate, a moderate perspiration breaks out, the pulse becomes soft, the thirst, which still continues, is however considerably less urgent, and there is generally a short and quiet sleep; the remission being gradually greater, and the comfort increased, until at the end of eight or ten hours the paroxysm begins to show itself returning, and again goes on to produce its usual effects. In this way the disease usually lasts about twelve or fourteen days; the paroxysms gradually becoming less and less severe, and the remissions more and more complete.

82. **Yellow Fever** (also called *bilious remitting fever*, *black vomit*, *Bulam fever*, &c., &c.) is a remittent fever, accompanied by yellowness of the skin, from which it derives its most common name, together with vomiting of a black or dark brown fluid, which has given it another of its designations. These two symptoms are the invariable accompaniments of the disease, together with all the usual marks of fever in a high degree. Thus, the weakness and pains in the limbs and head are intense, the eyes are red and fiery, the mouth is parched, and the tongue brown and dry, but with red edges; pulse frequent, full, and hard; skin hot, dry, and harsh; bowels confined, and the urine high-coloured, generally tinged with bile. In from 24 to 48 hours, these symptoms run on until the powers of life sink to a very low ebb, the skin becomes of a deep yellow, and the pulse is imperceptible or intermittent. There is bleeding from all the passages, with hiccup, constant vomiting of black matter like coffee-grounds, and, finally, exhaustion to death. In milder cases the symptoms gradually disappear, and a recovery takes place. The **Mortality** in this disease is enormous, 20 out of 21 being the usual rate.

83. **Infantile Remittent Fever** (sometimes denominated *infantile hectic*, *stomach fever*, and *worm fever*) is certainly a fever in which there is a paroxysm and remission daily, but the causes and nature of the disease are so different from that of the fever in the adult which has received the same name, that it is absurd to class them together. The infantile remittent is characterised by one or more daily febrile paroxysms and remissions, attacking children of all ages up to ten or twelve years, accompanied by pain in the abdomen and unhealthy motions. There is generally some slight disturbance of the brain, with headache and drowsiness, but not sound sleep. The pulse varies greatly, being always more frequent than natural, and the number of pulsations extending from 90 to 150 and upwards; it is seldom full, and often irregular. The tongue is furred, but moist, and with red *papillæ* showing themselves at the sides and tip. Appetite variable, sometimes voracious, at others totally absent. Sometimes there are as many as three distinct paroxysms and intermissions during the twenty-four hours—one in the forenoon, one in the afternoon, and another at night, which last is the longest and the most severe. In such cases the child is drowsy, and sleeps almost constantly during the attacks of fever, but never soundly, starting on the slightest noise, moaning, and talking incoherently. There is a troublesome amount of flatulence, amounting sometimes to a drum-like tension of the abdomen. Very often cough is present, with frequent respirations. The stomach is generally, in such severe cases, more or less attacked by nausea or vomiting, the appetite being almost always entirely gone. Yet, though the attacks are thus severe, in the remissions the child is able to sleep comfortably, or, if awake, looks about in comparative

case, and the pulse and respiration are reduced to little more than their natural standard. On the other hand, in the lowest and most mild type of this fever, there is but one attack during the twenty-four hours. The advent of the disease is very gradual, being almost imperceptible; the loss of flesh, spirits, and strength are the first symptoms noticed by the mother, accompanied with loss of appetite, flatulent enlargement of the abdomen, offensive breath, and general look of disorder. The skin is dry and harsh, and the cheeks are alternately pale and flushed with a hectic spot. The pulse is about 140 in the paroxysms, and descends as low as 90 in the remissions. Although the child is weak, indolent, and listless, yet he is rarely so ill as to make his confinement to his bed a matter of necessity, and in most cases, unless absolutely ordered to remain there, he will manage to loll about on sofas and chairs. By day, as well as by night, he doses and wakes up every ten minutes, picking his nose and his fingers, and moaning and complaining in the most fretful manner; the tongue is white and moist; thirst is absent; bowels obstinate, with evacuations of an unhealthy character, generally deficient in bile; urine scanty, and of a deep orange colour, depositing a considerable sediment. The disease either goes on to exhaust the child by defective nutrition, or it gradually loses its power, and recovery takes place.

84. INFANTILE REMITTENT may be confounded with water in the brain, from which it may be distinguished by the absence of squinting, and other prominent head symptoms, including distention of the veins of the scalp, and prominence of the fontanelles. There is also here more general fever, and less obstinacy in the bowels, which in hydrocephalus are very difficult to move; but none but an experienced practitioner can in all cases distinguish between the two diseases.

85. THE CAUSES OF INFANTILE REMITTENT are confined situations and improper food, which may be either of too poor a character, or so rich and exciting as to distend the stomach and bowels. Teething is very apt to aggravate the disease, but will not produce it in a healthy subject. Costiveness also is very likely to bring it on when connected with the above mentioned causes.

SECT. 3.—HECTIC FEVER.

86. HECTIC FEVER is remittent in its attacks, but as it always depends upon local irritation, it should scarcely be classed in the same division. The *symptoms* are very easily recognised, consisting merely in slight shiverings or chilliness, succeeded by flushings, which generally are accompanied by a peculiar spot of bright pink on each cheek, not shaded at the edges, and this hot stage ending in perspiration, which is often exceedingly profuse and exhausting. The paroxysms are commonly two in the twenty-four hours; one occurring at noon, and lasting three or four hours, when there is a remission till ten or eleven at night, at which hour the second attack comes on, and lasts till two or three in the morning, and is more violent in the symptoms which are exhibited. During the remissions the pulse and all the other actions of the body are restored, nearly, but not quite, to a healthy standard, and the appetite is frequently good enough to allow of a proper amount of food being taken. As the disease advances, however, the paroxysms increase in length, the intervals are shorter, and the appetite falls off; excessive sweats set in, alternately with profuse diarrhœa (called colliquation); and, finally, the patient is exhausted.

87. This fever may easily be known from others by the presence of the exciting cause, which is always some large drain upon the system in the shape of matter either from the lungs in consumption, from the hip in diseased hip joint, or from any other similar disease.

CHAP. VI.

ERUPTIVE FEVERS (EXANTHEMATA).

88. These diseases are characterised by fever more or less severe, followed by an eruption on the skin, and, as a rule, occur only once during the life of the individual, so that after one attack he is afterwards to be considered safe. They are divided into, 1st, *variolous fevers* (including small-pox and cow-pox); 2nd, *chicken-pox* or *swine-pox;* 3rd, *measles;* 4th, *scarlatina;* 5th, *plague;* and 6th, *miliary fever.*

Sect. 1.—Variolous Fevers,

89. Are marked by the occurrence of circular vesicles with depressed centres, gradually becoming filled with pus, and finally forming scabs, which fall off, leaving a small scar (or cicatrix, as it is called) behind. They appear to constitute one distinct disease, modified by peculiar circumstances; and both small-pox and cow-pox are mutually protective, so that, as a general rule, a person having had the one is not subject to the other. Both of them appear to depend upon inoculation, or in the case of small-pox, of contagion, for communicating them from one person to others, so that, unlike typhus fever, remittent fever, &c., they do not *now* arise spontaneously, whatever may have been the original cause.

Sub-sect. A.—Small-pox (Variola).

90. Small-pox is always attended by a general eruption of vesicles afterwards becoming pustules, and the number and course of these being a sign of the severity of the complaint, has been the reason for the describing the disease as *distinct* when the pustules do not touch each other, *confluent* when they run together, and *modified* when the eruption runs a shorter course, and the pustules are not perfectly developed in consequence of the previous occurrence of small-pox, or cow-pox, in the same person. In addition to these varieties, small-pox occurring *naturally* is somewhat different from that after inoculation. Each of these, therefore, must be separately described.

91. In Natural Small-pox, whether distinct, confluent, or modified, there are always three distinct stages—1st, that between the reception of the poison and the appearance of the eruption, called the period of *incubation;* 2nd, that from the first appearance of the eruption as a papula, or pimple, to its development into a perfect pustule, and called the period of *maturation;* while, 3rd, the subsequent period is called the period of *decline.* Incubation, commencing at the reception of the poison, is not always marked so early by any perceptible difference of the sensations; but sometimes there is a disagreeable taste or odour, or a feeling of giddiness, or an inward sense of alarm, which, it is true, may possibly be the cause rather than the consequence of the mischief done. Fourteen days are considered to be the average period which is occupied by this incubation, and this interval is passed very differently in different cases. In most cases no change is seen until the eleventh or twelfth day, when a severe *rigor* is felt, which is speedily followed by an attack of fever, called eruptive, accompanied by acute pain in the pit of the stomach, with nausea and often actual vomiting, also with giddiness and headache. This sometimes goes to the extent of producing actual insensibility, or convulsions, or epileptic fits. As the fever goes on it becomes higher and of a more inflammatory character, until at the end of about forty-eight hours from the first appearance of the *rigor*, the eruption shows itself on the face in the form of minute pimples, which are sensibly elevated, as perceived by the touch, and then the fever begins to abate. During the next twenty-four or thirty-six hours it extends gradually over the neck, arms, chest, body, and legs. On the *fifth* day a delicate and very small

vesicle may be detected in the middle of each pimple, and this, if carefully examined, will be found to have a depression in the centre, and to contain a colourless fluid. It is surrounded by an inflamed margin, which is called *areola.* By this time the fever has almost wholly disappeared. On or about the *sixth* day the eruption extends to the inside of the mouth and throat, which become swollen, accompanied by difficulty of swallowing and hoarseness, the saliva being also increased in quantity and becoming thick and ropy. By the *eighth* day the vesicles become filled with a yellowish matter instead of the previous colourless fluid, and hence they are now called *pustules.* In shape, also, they are changed, appearing almost to terminate in a point. The areola extends considerably, the face swells so as in severe cases to form one uniform mass in which all the features are obliterated. From the *tenth* to the *twelfth* day the pus becomes of an opaque yellow, a dark spot shows itself in the centre of each pustule, the areola subsides, beginning with the eruption on the face, where the swelling goes off at this time, but extends to the extremities. After the *twelfth* day the pustules gradually become scabbed by the drying of their contents, which break and discharge; these crusts or scabs finally fall off and leave the parts beneath them of a bluish brown colour, with permanent indentations, called pits, except in slight cases where they are wanting. In mild cases of small-pox, when the pustules are matured, the fever ceases altogether; but in the more severe forms, as soon as the eruptive fever has disappeared, another form sets in, called the *secondary*, which is characterised by great and distressing thirst, restlessness, and delirium. There is more or less general efflorescence of the skin in spots uncovered by eruption, and very often the cellular membrane becomes so inflamed that abscesses form, or erysipelas of a gangrenous nature makes its ravages, masked by the confluent pustules. The inflammation of the throat extends downwards into the lungs, which are often seriously congested or inflamed, or else the bowels or brain are attacked, generally soon ending fatally.

92. In Confluent Small-pox the above symptoms are well marked, and all those described are frequently met with, though somewhat modified in degree. In distinct small-pox, the eruption does not coalesce, and the swelling of the face is not nearly so great, nor is the secondary fever well marked, or often accompanied by any of the complications mentioned above.

93. In Modified Small-pox the symptoms are considerably altered in severity, and in the period of time which they occupy. The eruptive fever only lasts twenty-four hours, and is not often ushered in by *rigor* or sickness. The eruption shows itself on the face and arms at the same time, runs a much more rapid course, is very seldom confluent, and varies so much in the form and character of its pustules as to be incapable of any precise description. Some of them generally show the central depression, but the majority are of all shapes, and many of the pimples die away without being capped by any vesicle or pustule at all. As soon as the eruption shows itself, the constitutional symptoms disappear, though sometimes a slight secondary fever comes on about the sixth or seventh day.

94. It is somewhat difficult to detect small-pox in the early stages of its onset, but the severity of the fever, the occurrence of vomiting, and the *rigor* are pretty good guides, when coupled with the absence of the suffusion of the eyes and the sore throat so generally to be observed in measles and scarlatina, the two fevers with which it can chiefly be confounded.

95. The Mortality in Small-pox is about one in four, but the deaths at the Small-pox Hospital were still higher, the cases being picked and the collection of numbers of them together being adverse to a successful treatment. When death occurs prior to maturation of the pustule, it is generally caused by malignant fever. Between the eighth and thirteenth day the throat is the chief seat of a fatal complication. When

death takes place after the fourteenth day, it may be either from inflammation or congestion of the brain or lungs, or from gangrene and destruction of large portions of the skin and cellular-membrane; or, finally, at a very late period, death may occur from a break up of the system, and an incapability of rallying, in which case there is generally an erysipelatous eruption met with, which is accompanied by low fever.

96. INOCULATED SMALL-POX is now one of the "things that were," the practice being superseded by vaccination. For more than 1,000 years small-pox had been the opprobrium of physic before any one had discovered that any mode existed of assuaging its ravages; nor is it now known by whom the original discovery of inoculation was made. Our first accounts are derived from Constantinople, where we know it was practised commonly towards the close of the seventeenth century. In 1717 Lady Mary Wortley Montague astonished the world by her letters on the subject; and persevered in her intentions of benefiting mankind, by having her own daughter inoculated, in April, 1721, with complete success. After this, some doubts still remaining in the minds of the medical profession and the public, six criminals, under sentence of death, were pardoned by George I., on condition of their submitting to be inoculated, which again proving successful, the younger members of the Royal Family set the fashion; nevertheless it was a long time in becoming general, partly in consequence of several deaths which occurred; but ultimately the practice became almost universal among the better classes in this country, till superseded by vaccination.

97. THE BENEFICIAL EFFECTS of inoculation are shown in moderating the quantity of eruption, and in determining the force of the disease upon the surface. In a large proportion of cases the eruption is distinct and very scanty, though sometimes a full and confluent crop disappoints the operator, and the disease is as severe as when taken in the natural way. The average number of deaths at the Inoculation Hospital was about 3 in 1,000, instead of 3 in 10, which was then the average in the casual wards of the same building. With these acknowledged advantages it is now necessary to compare the results of vaccination as now universally practised in this country.

SUB-SECT. B.—COW-POX (VARIOLA VACCINA).

98. COW-POX is the disease which is now artificially introduced into the system, with a view of so acting on the body as to prevent its receiving the poison of small-pox, or of modifying its action, if so received. Towards the close of the eighteenth century small-pox still remained the chief scourge of the human race, for though, as shown above, inoculation was found to have the power of reducing its mortality to 3 per 1,000, yet such was the carelessness of parents, that in London alone 2,000 died every year, being one-tenth of the whole number of deaths. Inoculation, to be effectual, must be universally practised, because it has the misfortune attending upon it that it constantly keeps up a supply of contagious matter, and thus for every person inoculated and benefited by the process two or three were infected by natural means, and suffered all the full pains and penalties connected with it. At this time 45,000 persons died in England every year of small-pox; and inoculation, though generally practised among the higher classes, was confined to less than one-third of the whole population. But in 1798 Dr. Jenner announced to the world a new discovery of a means whereby all the good effects of inoculation might be obtained, without its attendant disadvantages; and it is not to be wondered at that the public should have seized with avidity the boon thus offered to them. For some years he had been investigating the nature of the disease which was well known to exist among the cattle of dairy districts, and was supposed to protect the people about them from small-pox; in 1798 he gave the results

to the public, in the shape of "An Inquiry into the Cause and Effects of the Variolæ Vaccinæ." In this work Dr. Jenner announces his belief, that the disease he is describing does not originate with the cow, but is communicated to that animal from the horse. He next throws out the suggestion (which has since been followed out by others) that small-pox itself may have been originally introduced as morbid matter of the same kind, but aggravated by local and accidental causes into the form which we now recognise as small-pox. He then states his conviction that cow-pox, when it has once passed through the human body, leaves the constitution for ever after secure from the infection of small-pox. In 1801, within three years of the publication of "The Inquiry," 6,000 persons were vaccinated, by far the greater number of whom were tested as to their immunity from small-pox. Previous to this time, viz., in 1799, a testimonial was signed by 33 of the most eminent physicians and by 40 distinguished surgeons of London, recommending vaccination as a safe and efficient protection against small-pox, an act which will always afford an argument in favour of the readiness of the profession to support a novelty when founded on truth. Since this time it has gradually spread into general use and estimation; and it is enforced by an Act of the Legislature, which makes vaccination imperative upon all.

99. Casual Cow-pox in the cow, as well as in man, has been well described by Dr. Jenner in 1798, and by Mr. Ceely, of Aylesbury, in 1840. It is a disease of frequent occurrence, attacking the udders chiefly of the milch cow, and from them being propagated to the hands of the milkers. It is a pustular eruption, made up partly of pustules similar to those which we are accustomed to see on the human arm, and partly of irregular and larger pustules. In man it appears on the hands and wrists, in the form of inflamed pimples, which run on to form pustules of a circular form, with a central depression, and of a bluish white colour. After a time, absorption takes place in the usual way, accompanied by inflamed streaks up the arm, and followed by enlargement of the glands in the arm-pits. Fever succeeds, with the usual results—headache, and often delirium; but these constitutional symptoms do not last more than a few days, while the sores on the hands often continue troublesome and difficult to heal for some weeks. Matter taken either from the pustules of the cow, or those on the hands of the milkers, when introduced into the skin of human beings who have not passed through this disease or small-pox, produces a similar pustule in many cases, though not with as much certainty as after several transmissions. When this vaccination does succeed it is followed by very considerable constitutional disturbance, and seems to afford very decided protection against small-pox, probably in proportion to the severity of the vaccine fever.

100. The Identity of the two Diseases was suspected by Jenner, but his idea was that small-pox is cow-pox aggravated by circumstances in passing through the human frame. Another and opposite theory has been broached, namely, that cow-pox is small-pox modified by transmission to the cow from man, and many experiments have been performed with a view to prove its capability of being thus transmitted. On the Continent greater success seems to have attended the attempt than in this country, where Dr. Gregory, at the Small-pox Hospital, and Mr. Ceely, at Aylesbury, have signally failed in their attempts to infect the cow by hanging blankets taken from the bed of a small-pox patient around her, though the latter gentleman succeeded in producing good pustules on the cow from inoculation with small-pox matter taken from man. As far as negative experiments go, it has been shown that small-pox is not readily communicable to the cow, and the full identity of the two diseases must chiefly rest upon theoretical grounds. Still there is enough to show that they are, either in one way or the other, transmitted

from man to the cow, or from the cow to man. After all, the matter is only of speculative value, and the gist of the question lies in the amount of the protective power residing in the vaccine disease, as artificially produced.

101. THE COW-POX, as displayed in ordinary vaccination, is usually a disease which has passed through many generations since the lymph employed in its production was first taken from the cow. From this cause it is often too mild in its action, and I believe that here is to be found the true cause of its failures in protection being more frequent than they formerly were. If due care is taken in the selection of good lymph, it may probably be many years before it degenerates so far as to be useless; but in the careless way in which vaccination is often performed, it is no wonder that the operation so often fails. The following is the account of a fully successful vaccination:—On the second day after the introduction of the lymph, the punctures may be felt slightly elevated; and on the third, by the use of a lens, they are seen to be surrounded by a slight circle of red. On the fifth, a distinct vesicle is formed, having a depressed centre, which gradually enlarges, so that on the eighth day (being the corresponding day of the following week) it appears distended with clear lymph, the vesicle being circular and of a pearly or slightly yellowish-white colour. In form and structure it exactly resembles the pustule of small-pox. Its margin is turgid, firm, shining, and wheel-shaped. It is composed of a number of cells which secrete the lymph filling them. At this time there is a slight circle of red around the vesicle, but no decided areola. (See *fig.*, showing the daily progress of the vesicle.) On the evening of the eighth day the areola, or inflamed ring, begins to show itself and continues to increase for forty-eight hours, extending from one to two inches from outside to outside. After this it begins to subside, leaving, as it goes off, several concentric circles of a bluish-red. About the tenth or eleventh day the vesicle bursts and the matter dries into a hard brown scab, which contracts and becomes almost black; and about the twenty-first day falls off, leaving a scar, which is more or less circular, and depressed below the level of the surrounding skin. This is indented with several minute pits separated from each other by streaked lines of white. All these appearances should be carefully studied in the figures herewith given, so that they may be recognised by those who are watching the progress of the disease. There is more or less febrile disturbance coming on about the seventh or eighth day and lasting till the areola disappears. In the child it goes on to make him restless and hot, and the bowels are often more or less disordered. Such is the regular and satisfactory progress of the disease. When the matter employed is of a spurious or worn out character, or the constitution is not in a condition to absorb and develope the poison, the course of the vaccine disease is not so regular, and the vesicle either progresses too rapidly or too slowly, and is either too large or too small, with an areola of enormous size and a high degree of inflammation, or in some cases with scarcely any. Unless, therefore, the vesicle follows the course described above, little reliance can be placed on its protective powers, and the operation should be repeated at a future time.

102 Sometimes the matter of cow-pox is introduced into the system of a person who is under the influence of some other eruptive disease, and in this case the former will be considerably modified in its course. Chicken-pox has little effect upon cow-pox, but small-pox exerts a curious influence upon it—depending, however, greatly upon the relative stage at which the two diseases co-exist: thus, where cow-pox matter is inserted during the incubative stage of casual small-pox, the vaccine vesicle seldom advances, or, if at all, very imperfectly, though occasionally the two run a regular course in the same individual. When the variolous and vaccine lymphs are both inserted on the same day, they each frequently run their separate course, presenting their peculiar characters, and without modifying each other; at

other times they seem to moderate the action of both, and neither is well developed. When the vaccine lymph is inserted four days before the variolous, both diseases advance locally, but the general eruption of small-pox is greatly modified, if it appears, and is frequently absent altogether. If the variolous matter is inserted more than a week after a successful vaccination, no pustule rises, and the inoculation is wholly abortive.

103. **Bryce's Test** is often much relied upon as a proof of the successful performance of vaccination, and to a certain extent it certainly is so. It consists in a second vaccination on the fifth day after the first, when the vesicles so caused ought to rise very rapidly, and overtake the first set, scabbing at the same time, and afterwards disappearing together with them. Unless these stages are thus developed together, he considered that the disease was not to be relied on; and by many careful observers the same rule has been maintained, but as it did not meet with Dr. Jenner's approbation it has not enlisted that of his servile followers. It is, I believe, a tolerably good proof, and at all events is quite innocent in its effects. One good result is that it ensures a sufficient number of punctures, and without it many people are very apt to be contented with a single vesicle, or perhaps two.

104. **Re-vaccination** at stated periods is now very generally practised, and is probably a great means of insuring the permanent effect of the original operation, by showing that the constitution is still occupied by the effects, whatever they may be. It is scarcely necessary to remark, that cow-pox does exercise its wonderful power in a marked degree, and for a long time, since the experience of more than half a century proves it indisputably. No one can show that it has any power beyond that time, because vaccination was not adopted more than 58 years ago, and few are now living and exposed to small-pox who were operated on so early as that time. It is, however, well known that the protective power is not absolute; and it is supposed that it gradually wears out, so that many people advise a periodical vaccination of the whole population, some going so far as to recommend it to be adopted in all cases every five years. That in many cases its power extends for 40 or 50 years is well known, but what the average duration may be is a subject of dispute; so that it is perhaps better to err on the safe side, if it is an error, and re-vaccinate every 10 or 15 years. The following are the usual results of this operation:—

1st. When the interval is not more than five years after a successful vaccination, the punctures give rise to no inflammation at all. After seven or ten years the virus produces some local irritation, and on the third or fourth day after insertion an areola of irregular shape appears, surrounding a minute and acuminated vesicle, which is very irritable, and smarts and itches in the most disagreeable manner. The glands in the arm-pit often swell, and sometimes there is a good deal of constitutional disturbance. On the seventh or eighth day a small scale has formed, which falls off rapidly, leaving no scar behind.

2nd. When the primary vaccination has been only partially successful, the vesicles form more gradually, without the local or constitutional irritation described above. A slight areola is developed on the seventh day, when there is a vesicle of tolerably well-formed shape, but yielding a small quantity only of lymph, and this is incapable of reproducing the disease.

3rd. Should the primary vaccination have been wholly unsuccessful, the re-vaccination may produce the full effects of the disease—that is to say, if the constitution is not still in a condition to resist its influence. In this case the lymph is fully capable of transmitting the disease to others.

Reasoning backwards, therefore, when either of the above sets of results follows re-vaccination, it is safe to come to the conclusion, that in the first case the primary operation is still in force, and protects the constitution: in the second, it is not fully to be depended on, but the re-vaccination should be repeated at a short interval; and in the third, it may be concluded that the first operation was wholly useless, from some cause or other, or that it had ceased exercising any particular power on the constitution.

105. **The Comparative Protective Power** of the two diseases is very difficult to express in figures; but the following table may serve to show in some degree the relation of the two in this respect. It is founded on facts recorded by M. Favart during an epidemic small-pox which raged in Marseilles in 1828. The population was 40,000 under 30 years of age, of whom 30,000 had been vaccinated, 2,000 had small-pox, either casual or inoculated, and 8,000 were wholly unprotected. The numbers are corrected, so as to give an uniform amount of 15,000 to each set.

	Unprotected.	Had Small-pox.	Vaccinated.
Estimated number	15,000	15,000	15,000
Attacked	7,500	150	1,000
Died......................	1,875	30	10
Proportion of attacks to estimated number......	1 in 2	1 in 100	1 in 15
Propor of deaths to attacks	1 in 4	1 in 5	1 in 100

The conclusion from this table may be drawn, that vaccination, though a less complete protection against the occurrence of small-pox than a previous attack of that disease itself, is yet a better protection against death from its effects. Thus it will appear, that though out of 15,000 who had previously had small-pox casually or by inoculation, only 150 were afterwards attacked by it, yet of them 30 died; while of 15,000 vaccinated persons, in spite of 1,000 being seized by small-pox, 10 only died, the mortality being as 30 to 10. On this calculation, which is generally held to be correct, the superior advantage of vaccination over inoculation is fully established. It may not be able to eradicate the disease, but it is a powerful means of lessening the violence of its ravages; and the legislature has no doubt acted wisely in enforcing the practice of vaccination. (For the surgical operation required to produce the vaccine disease, see *Operations of Surgery.*)

Sect. 2.—Chicken-pox (Varicella).

106. **Chicken-pox** (also called *swine-pox*, and *bastard-pox*) is a very slight and trivial disease. It is ushered in by the usual symptoms of mild fever, which lasts about twenty-four hours; after which an eruption appears, showing itself generally first on the back and shoulders, and not on the face as in small-pox and measles. At first there are small pimples, similar to those of small-pox; and it is only by their first occurrence in the different situations, and by the slight degree of fever, that it is possible to distinguish the one from the other. Indeed, modified small-pox and chicken-pox are so closely allied, that no one can always say with certainty, except by a reference to the contagion from which it sprung, to which a particular case may belong. On the *second* day, the pimples show a small vesicle on their heads, containing a yellowish or straw-coloured transparent lymph, and resembling little scalds from hot water. On the *third*, they attain their full size, soon after which they burst and form a thin scab. Sometimes as these fall off they leave no trace or scar, but very generally one or two about the face or on the temples will be picked by the child, and thus a scar is produced not really dependent upon the original affection.

107. By many it has been supposed that the small-pox, cow-pox, and chicken-pox are all modifications of the same disease; but the arguments against this position are so strong, as to make it pretty clear that chicken-pox is distinct from the two others—for, 1st, it is not capable of propagation by inoculation, although highly contagious; 2nd, it is neither prevented by, nor does it prevent, small-pox or cow-pox, and it frequently runs its course at the same time with the latter disease.

108. It is entirely free from danger, except from gross neglect and exposure during its attack.

SECT. 3.—MEASLES (RUBEOLA).

109. MEASLES, sometimes known as *morbilli* (the little plague), is a disease so general in this country, that almost all are subject to it at some period of life, and occasionally more than once, three attacks having been known as occurring to the same individual in the course of his life. It consists in an inflammatory fever of a contagious character, which lasts about three days, and is then followed by a rash, at first appearing in small dots, not unlike flea-bites, but these soon coalesce and form patches of a semi-lunar shape, clearly perceptible to the touch from being raised. They appear first on the face, and thence spread gradually over the whole body, lasting from three to four days, and then disappearing with an almost imperceptible scaling, or desquamation, as it is called, of the cuticle. The eruption is almost invariably preceded by sneezing, more or less cough, watering of the eyes, which are red and intolerant of light, and other symptoms of a "severe cold." The skin is hot and dry, with occasional chills, and the pulse quick, with some considerable power. Sometimes the precursory symptoms are so slight as scarcely to give any notice of the eruption, which shows itself on getting up in the morning to the astonished patient, when he looks in the glass for the purposes of the toilet. At others, and especially in the adult, they are very severe, and indeed so much so as to occasion great danger from their effect upon the brain or lungs. If the former is attacked there may be convulsions or delirium; if the latter is much affected, there is inflammation of the substance of the lungs (pneumonia), or of the mucous membrane (bronchitis). Sometimes, moreover, the course of the disease is not so regular, and the eruption appears after a long feverish struggle, and runs a much shorter, or perhaps a longer, course. These, however, are the exceptions, the rule being as given above. Like most other febrile diseases, measles sometimes goes on to assume the typhoid form, and is then highly dangerous. The eruption appears only partially, and is of a dark livid hue, mixed with true *petechiæ*. There is also some local congestion in all such cases, accompanied by severe symptoms of the affection of some particular organ attacked—that is to say, by convulsions, or difficulty of breathing, or diarrhœa, which last is often of a dark and bloody mucus.

110. MEASLES IS CAUSED by specific contagion, which, as a rule, is only capable of being once received during life. It is distinguished from scarlatina by the more purple hue of the eruption, and the presence of the catarrhal symptoms, as well as the absence of throat affection; from smallpox, by the absence of vesicle after the second day; and from rose-rash, by the catarrhal symptoms and the darker colour, as well as the semi-circularly patched form of the eruption. The *period of incubation* is from six to sixteen days; and it is often followed by affection of the lungs, diarrhœa, enlarged mesenteric glands or parotids, ophthalmia, and inflammation of the ear.

SECT. 4.—SCARLET FEVER (SCARLATINA).

111. SCARLET FEVER is a highly contagious disease, varying in intensity from a very mild attack, to one which destroys life in 36 hours. Hence it is often considered as divisible into three species—1st, *simple scarlatina*; 2nd, *scarlatina anginosa*; and, 3rd, *malignant scarlatina*: but these three forms shade one into the other, and even in particular epidemics every degree is seen from the one extreme to the other; still each of them merits examination as being a type of that degree of severity with which the name is associated.

112. In all cases there is a contagious fever, which is generally accompanied by high action of the heart and arteries, and by an excessive development of heat in proportion, so that the skin feels pungently hot in bad cases, and in moderate attacks is unpleasantly so to the touch; sometimes, however, the fever is of the typhoid kind. On the second day of this fever, though some-

times later, a scarlet efflorescence of the skin and mucous membrane of the mouth makes its appearance, the extent and colour of which varies with each degree of the disease. It usually lasts three days, and then disappears, being followed by a remarkable shelling off or desquamation of the whole cuticle in large patches, which is highly characteristic of the disease. There is usually more or less inflammation of the throat, which will presently be alluded to; but sometimes this is absent, and at others, though the poison is undoubtedly that of this disease, the eruption does not show itself.

SUB-SECT. A.—SIMPLE SCARLET FEVER.

113. IN SIMPLE SCARLET FEVER, there is only a moderate degree of fever, with a full eruption, which comes out first on the face, neck, and chest at the same time, and on the next day gradually spreads over the arms, trunk, and legs. The whole body is pungently hot and dry. The rash is continuous on the face, arms, and legs; but on the trunk, it is in large patches, varying in shades of colour. It is most vivid in the evening, and is generally much paler in the morning. On the first day the tongue is covered with yellow fur; but on the second, the edges begin to show a bright red surface, which looks raw, as if recently peeled, and this soon extends to the whole mucous membrane of the tongue and palate, which is of a uniform bright red. In other respects it agrees with the description given in the last paragraph.

SUB-SECT. B.—SCARLATINA ANGINOSA.

114. IN SCARLATINA ANGINOSA, which has received no popular name, the fever and eruption are much the same as already described, but generally more severe, and early in the attack there is more or less "sore throat." The patient complains of a stiffness of the muscles of the neck, with a feeling of roughness in the throat, pain on swallowing, and hoarseness. On examining the interior, the palate, uvula, and tonsils are red and swollen, and there are often patches of white, from lymph effused on the surface. These patches are sometimes stained with black, giving them somewhat the appearance of the gangrene, which is an accompaniment of the malignant form; but if the throat is washed out by gargling, they come away in shreds, leaving the mucous membrane red and inflamed, but sound. There is often severe inflammation of the mucous membrane of the stomach and bowels, accompanied with vomiting or diarrhœa. The parotid glands and those of the neck, swell, and there is often a discharge of matter from the ears, indeed the whole of the adjacent parts are seriously inflamed. Unless, however, the disease assumes a malignant form, these local complications generally disappear without permanent injury.

SUB-SECT. C.—MALIGNANT SCARLET FEVER.

115. THE MALIGNANT SCARLET FEVER is a frightful disease, sometimes known by the name of *gangrenous*, or *malignant sore throat*, or *malignant quinsy*. The disease, however, is always due to the contagion of scarlet fever; and it is capable of being produced from the second species (par. 114), or of producing that form from itself by contagion with others. The symptoms come on with alarming rapidity, and very early assume the character of typhoid fever, conjoined with frightful mischief in the throat. There is at first the usual premonitory fever, accompanied generally by delirium of a low muttering kind, and a small rapid and irregular pulse. The eruption is very uncertain in coming out, being sometimes wholly absent, and in general faint, except in a few patches, which assume a deep hue of a livid colour. The skin instead of being pungently hot is comparatively cool, and even cold in the extremities. The eyes are suffused and dull, countenance anxious and pale, except the cheeks which are flushed. The tongue is covered with a brown fur, which quickly becomes dry and black, peeling off at the edges, if the

strength continues to hold out, and then leaving the mucous membrane bare, red, and glossy. The odour from the skin and breath is dreadfully unpleasant, giving the idea of rottenness in the highest degree. The throat is not very much swollen, and is not so painful as in the *scarlatina anginosa;* it is of a dark red hue, and covered with small ash-coloured sloughs, surrounded by a livid margin. These rapidly extend both in surface and depth, and destroy the whole uvula, palate, and tonsils. There is a viscid mucus thrown out which interferes with the admission of air, and yet is most difficult to remove, so that the patient is tormented by his efforts to get rid of it. The glands now enlarge, and the whole of the mucous membrane of the nose, throat, and lower air passages participate, so that there is generally some considerable amount of cough and difficulty of breathing. In many cases death takes place in from 36 to 72 hours, occasioned either by suffocation or by hæmorrhage from the throat or bowels. In others, the disease goes on for five or six days, and the patient sinks exhausted; while in the more fortunate cases, the strength is such as to bear the frightful amount of mischief with impunity, and the ulcers gradually heal, though leaving the throat permanently impaired in its functions.

116. SCARLET FEVER is caused in all cases by contagion, the period of incubation being very variable, some individuals having been seized within a few hours after infection; while in others, five or six weeks have elapsed afterwards before the disease showed itself. Neither is it very clear when the disease ceases to be communicable, as there are numerous cases on record in which convalescents from scarlet fever, after their removal for a considerable distance from the place where they had passed through the disease, have infected others, though several weeks had elapsed since the period of desquamation commenced. It is, therefore, necessary to be very cautious in all matters connected with the contagion from this disease, and especially in reference to the *fomites* (see article *Contagion*). A second attack is very rare, much more so than in measles. Scarlet fever is followed by several troublesome local affections, and particularly by dropsical effusion, either into the cellular membrane of the extremities, or into the cavities of the chest, head, or abdomen. It is very remarkable that the severity of the disease itself has no effect upon this sequel, slight cases causing it just as often as severe. It generally comes on ten or twelve days after the desquamation of the cuticle. The urine is generally loaded with albumen, so as to coagulate by heat (see *Urine*), and the state is one which requires active interference. Besides this dropsical condition, ophthalmia, enlargement of the glands, and abscesses are the most frequent sequels of the disease.

SECT. 5.—PLAGUE

117. Is a violent and malignant contagious fever, with an eruption, which consists in pustules of a white, livid, or black colour, together with buboes and carbuncles. It is chiefly confined to Asia and Africa—Egypt and Smyrna being the most prolific sources of contagion. The symptoms are violent fever, of a typhoid character, with sudden loss of strength, so that those attacked by it often stagger and fall in the streets; bilious vomiting, a swollen and furred tongue, quick, and feeble pulse, with general cessation of the secretions. Swellings in the groin and arm-pits now show themselves, which are either light-red or of a dark-purple colour—the latter being the most fatal. In bad cases, death takes place from exhaustion in twelve hours, while in others it is more retarded, or when recovery is effected, a critical perspiration breaks out, the buboes suppurate, and all the powers gradually return.

SECT. 6.—MILIARY FEVER.

118. This term is applied because the fever is attended by an eruption of vesicles resembling *millet* seeds in colour and size. It is decidedly contagious, but can scarcely deserve the name of a distinct fever, as it more commonly occurs in the course of other diseases,

such as inflammations of various kinds, or the progress of recovery from childbirth, and appears to be often due to over-clothing in bed. Sometimes, however, it is epidemic, or at least the eruption accompanies an epidemic. It appears in the shape of small round vesicles about the size of a millet seed, with a slight surrounding blush of inflammation. It is most abundant on the neck, breast, and back, and often appears and disappears more than once. The vesicles are at first so small that they can scarcely be seen with the naked eye. Miliary fever can only be confounded with eczema, from which it may be known by its being accompanied by fever, which is absent in the latter, and by the separate existence of the vesicles. The duration is very uncertain, and the fever is not diminished on the appearance of the eruption. Altogether it is a most indefinite disease, and one which may generally be regarded rather as a symptom of some other complaint than as one *sui generis.*

CHAP. VII.

THEORY OF CONGESTION AND INFLAMMATION.

SECT. 1.—DEFINITION OF CONGESTION AND INFLAMMATION.

119. These two diseased conditions of parts of the system are somewhat alike, in the evils which they often produce, and in both of them being chiefly connected with the blood vessels and their contents. Nevertheless, there is a material difference between the two; and as the treatment required for the relief of one is often opposed to that which is useful for the other, it is of great importance to be as far as possible able to distinguish between them. The two have several symptoms in common, and to the unpractised observer there is great difficulty in making the distinction. In both there is a greater quantity of blood collected in the part, causing generally *a swelling;* in both there is more or less *increase of heat;* in both there is some unusual degree of *redness* consequent upon the additional supply of blood; and both are generally, though not always, accompanied by *pain.* When, therefore, we have these four symptoms co-existing in any part of the body—viz., *swelling, increased heat, redness,* and *pain*—it is clear that there is either congestion or inflammation present in it.

120. THOUGH THE TERM CONGESTION is constantly used by all those in the present day who discuss the nature of disease, either as professionals or amateurs, yet the exact nature of the process in which it consists is not clearly ascertained, and arguments on the subject are continued to this day. The following, however, I believe to be the most probable theory of its essence.

121. CONGESTION may be considered as consisting of two quite opposite kinds of disordered action. *In the first,* there is an excess of functional activity of the part, including chiefly an increased flow of blood, such as occurs in persons of active minds and sluggish bodies, when the mental faculties are too severely taxed, and who have too large a quantity of blood supplied to the head, as shown by the increased pulsations of the carotid arteries and the suffusion of the eyes and face. This is an instance of what is called *active congestion;* and here there is simply an exaltation of the natural function, but no change, and the flow of blood is accelerated, not impeded, which, contrary to the popular belief, is the case in congestion of *the second kind,* usually denominated *passive.* Here, there is a deficiency of functional energy in

the part, and the circulation through it is retarded. As instances of this state, may be adduced the condition of the lungs, when there is any obstacle to the proper aeration of the blood, or the state of the liver when bile is not properly secreted by its cells. *Both are instantly relieved* as soon as the peculiar duty of the part is healthily carried on, and both seem to depend upon a want of tone in the arteries, from the blood contained in them being in an unfit condition to give the proper and accustomed stimulus. These two states of congestion have each a tendency to lead on to inflammation; but we must now examine as to that condition, and see in what they both differ from it.

122. INFLAMMATION is attended by certain symptoms peculiar to itself, and beyond those common to it and congestion, though not always recognised at first sight. Thus, *in the first place*, it has always a tendency to change the natural function, and not merely to exalt it; and hence, in inflammation of serous membranes, the serum is changed into lymph or pus, and in that of mucous membranes the mucus becomes serum or lymph or pus. *Secondly*, in the blood, as the necessary precursor of any extensive inflammation, there is always found an increased quantity of fibrine, amounting to nearly one per cent. in many cases; but to produce the disease itself there must co-exist a depressed vitality of the tissues in some part of the body, either originated within it, or from accidental circumstance external to it. This unfits them for their regular duties, and especially for their nutrition. Accompanying this lowered vitality and imperfect nutrition, there is a languor in the flow of blood through the capillary vessels of the part, and a distended state of their walls, which leads to the unhealthy process to which I have alluded. It may, therefore, be considered that inflammation for its development requires—1st, *a peculiar state of the blood*; and, 2ndly, a *lower vitality* in the part which is to be the seat of the disease, and that its essence consists in a *change in the function* of the part affected, accompanied by the four symptoms enumerated at paragraph 119.

SECT. 2.—EFFECTS OF INFLAMMATION.

123. INFLAMMATION thus consisting in an essential change in the functions of the part affected, accompanied by the symptoms enumerated at par. 119, it is next important to ascertain what that change is. We find that it consists in—1st, the *deposit of lymph*, which is almost identical in composition with the fibrine above mentioned; 2nd, in the formation of *pus*, or, as it is commonly called, *matter*; 3rd, in *gangrene*, slough, or mortification, as a result; but this can scarcely be called a change in the function, since all function ceases in death. Each of them must now form the subject of a separate examination, as they are all of great importance in the investigation of inflammation. There are also some other results of inflammation enumerated by some authors, such as an increased flow of serum and mucus; but these are rather to be considered as the consequences of active congestion (par. 121) than of inflammation, as here defined. The two processes are so distinct, that I have no hesitation in saying, that the term inflammation is properly confined to that here described, and then there can be no doubt that the serous and mucous discharges, while still serum and mucus, are the consequence of active congestion, and not of inflammation. Nevertheless, it must be remembered that it is only a limitation of terms, and not a discovery of a new diseased action, which is propounded by those who make the distinction, and it is more for the sake of greater accuracy in definition than for any other purpose that the limitation is here advocated.

124. A DEPOSIT OF LYMPH, as the result of inflammation, may be made simply for the purpose of repairing an accident, as where there is a cut or tear, and the two surfaces are brought together. Here the space between the two is filled with this plastic material, which soon becomes organised and glues the two portions together, the process being called "union by the first intention." Under highly favourable

circumstances there is little or no inflammation attendant upon this process, and the union is completed in the course of about four days. Exposure to the air, after the first two or three hours, is a sure preventive of this process, as well as excessive inflammatory action, and in that case the fibrine is converted into pus, and an abscess is formed in the one case, or else a state called ulceration is established on the exposed surface.

125. THE PUS THUS FORMED from fibrine differs from the lymph in not being capable of organisation, or, in the language of the physiologist, it is not a *plastic* material. It is a creamy, yellowish white fluid, smooth and free from offensive smell when healthy, in which condition it is said to be *laudable.* But either lymph or pus may also be poured out into the substance of an organ, especially if it is of an open or spongy structure, like the cellular membrane. In the first case there is a consolidation of the texture, which becomes what is called "hepatized," or "made like liver"—a very common result of inflammation of the lungs; but in some forms of inflammation of the cellular membrane pus is diffused in small quantities through its cells, floating in serum, and without any walls of lymph, as in the case of a common abscess. The two fluids are also both poured out in the closed and open cavities from the serous and mucous membranes as a result of inflammation. As a general rule, when pus is formed within the substance of an organ, the surrounding tissue becomes consolidated by the deposit of fibrine in the shape of lymph, and this constitutes a wall of defence which confines the pus within its limits, and prevents the infiltration of the surrounding tissues. This wall, or bag, with its contained matter, together constitute an *abscess.* When, on the contrary, pus is thrown out on the surface, there is generally in the first place an inflammation of such a nature that the tissue dies and is separated, leaving a vacuity, which is called an *ulcer.* If this process extends, the ulcer is said to be a *sloughing ulcer*; while on the contrary, if there is a reparative process going on, it is said to be in a *healing state.* In the latter case, the fibrine thrown out is partly organizable, and forms little red masses, called *granulations,* partly pus, which has no organizable property. The granulations are quickly filled with blood vessels, and then assume the nature of the adjacent parts with which they cohere, and by contracting bring them closer together, so as completely to get rid of all vestige of a wound. These granulations may be healthy when of a sizo which will readily lead to the organization of a new structure, or they are too low and feeble, or again too exuberant and large, and then called "proud flesh."

126. MORTIFICATION, SLOUGHING, or GANGRENE is the entire death of a part of the body; and though, as before remarked, usually considered as a result of inflammation, yet it is rather a concomitant than an effect. Both are produced by some ulterior cause acting upon the part affected, which has such power as to destroy life in the one portion, and to establish inflammation in the adjacent tissues in order to get rid of the dead matter. In this way a caustic, while it destroys the life of a portion of skin, irritates the surrounding tissues enough to produce an ulceration of the whole surface in contact with it, and thus not only to get rid of the dead slough, but to commence a new action which will fill up the gap with new skin.

127. BY COMPARING the whole of the symptoms of congestion and inflammation, it will thus appear that though on a superficial examination they resemble one another, and especially in the four signs of increased heat and redness, swelling and pain, yet they have essential points of difference; first, in their essence, inasmuch as there is no increase of fibrine in congestion; and, secondly, in their consequences, since, in congestion, there is no change of function, except a difference of degree while inflammation is followed by the secretion of tho new matters, lymph and pus.

SECT. 3.—SEATS OF INFLAMMATION AND CONGESTION.

128. Bearing the above leading

points of distinction in view, we must now proceed to investigate the effects of these diseased conditions upon the various tissues known as the skin and mucous membranes—the cellular, serous, fibrous, and bony tissues—the glands and absorbents—all of which suffer in different ways from inflammation and congestion.

SECT. 4.—DEGREES OF ACTIVITY IN INFLAMMATION.

129. Congestion has already been described as active and passive, which are something more than differences of degree; and inflammation is commonly spoken of as consisting of the two degrees of intensity known as acute or active, and chronic or slow. Sometimes a third variety is made, which is called sub-acute; but the divisions are entirely arbitrary, and may be increased to any extent. From the ordinary meaning of the words used, it will readily be understood that acute inflammation runs its course rapidly, and chronic exactly the reverse. Moreover, inflammation is said to be of a healthy or unhealthy character, according to whether it has a tendency to restore the part to a state of health, or to continue its inroads upon it. The term "irritation" is very often confused with congestion or inflammation; but as it is by no means necessary to the consideration of these subjects, it is omitted altogether, being, when properly applied, confined to the agent which produces them, and not to the effect produced. Thus, inflammation of the eye is due to the irritation of lime blown into it, or inflammation of the skin to the irritation of its nerves, caused by boiling water, &c., &c. Bearing these remarks in view, we may now proceed to the inflammations and congestions of the various structures.

SECT. 5.—SYMPATHETIC FEVER ACCOMPANYING INFLAMMATION.

130. When any severe or extensive inflammation exists for any length of time, a fever of a peculiar character always accompanies it. This is sometimes called inflammatory fever; but as that term is also applied to a form of continued fever accompanied with inflammation, the term is chosen which heads this section. The symptoms are not different from those which have been already described as constituting continued fever, and, as in that case, there is a slight aggravation in the evening, and a corresponding remission in the morning. The heart is almost always considerably excited, and the pulse quick, full, and hard, and often strong, though sometimes small and wiry. When the blood is drawn it is always "buffed and cupped," the former due to the increased quantity of fibrine, which delays the coagulation, and allows the red particles to sink below the surface; while the latter arises from the contraction of the fibrine drawing in the upper part, and causing it to form a cupped surface. This state was formerly thought to be a positive proof of the presence of inflammation; but though it almost always accompanies that condition, it is found also under other circumstances, and is not therefore fully to be relied on.

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CHAP. VIII.

THE STRUCTURE OF THE MUCOUS MEMBRANE AND SKIN IN HEALTH AND DISEASE.

SECT. 1.—GENERAL VIEW OF THE SKIN AND MUCOUS MEMBRANE.

131. As these organs are continuous, and may each be considered as a modification of the other, it is not surprising that their diseases should be nearly alike. Both are extremely well supplied with blood vessels; in the case of the skin, chiefly for the due nutrition of its nerves; and in that of the mucous membrane, for the processes of absorption and secretion, which it is constantly carrying on. Both are constantly submitted to irritating influences applied to their respective surfaces, and in both we find the state called *active congestion* more common than inflammation, and almost always preceding its attacks.

132. The mucous membrane being divided into several portions, according to the organs which it lines, it may be said to consist of—1st, that lining the ear, mouth, and nose, as well as the front of the eye; 2nd, that of the bronchial tubes; 3rd, the membrane lining the stomach and bowels; 4th, the mucous lining of the contents of the pelvis; and, 5th, the linings of the ducts of the various glands. These are all continuous at the various external openings with the skin, so that together they form a complete covering and lining, between which the whole animal is enclosed.

133. Both the skin and mucous membrane consist of two layers, which in the former are called cutis and cuticle, or sometimes derma and epiderma, or, again, scarf and scarf-skin. In the mucous membrane, the corresponding parts receive the names of corium and epithelium. The derma or cutis in the skin, and the corium in the case of the mucous membrane are composed of a tough membrane, supporting a vast network of blood-vessels and nerves, as well as numerous small glands and their ducts. One surface is attached to the body by common cellular membrane, the other has a velvety structure, which is called papillary in the skin, and villous in the mucous membrane. On the general surface of the body, these papillæ are short and exceedingly minute; but in the palms of the hands and the insides of the fingers and toes, they are long and of considerable size, being also distributed in rows. The corium of the mucous membrane varies still more in the forms of its villous surfaces, which are sometimes like honeycomb cells, as in the stomach, and sometimes like very projecting papillæ, as in the small intestines; while in the large intestines they assume the honeycomb form again, but in a more minute state of subdivision. The papillary surface of the cutis secretes the cuticle, which at the same time serves to defend and protect its parent. This cuticle varies much in thickness, according to the part of the body which it protects, being very strong and horny in the soles of the feet and palms of the hands of those who perform any manual labour, as well as in all other situations where regular pressure is made upon the skin. In the folds of the joints where there is little pressure, and where the skin requires to be very pliable, the cuticle is very thin and delicate. As fast as the exterior is worn away by friction on the outside, fresh layers are added on the inside from the papillary surface of the skin. Throughout the mouth and gullet, the epithelium resembles the epidermis in all respects, and is so continuous with it at the margins of the external openings that it is difficult, when the two are removed entire, to fix where the one ends and the other begins. At the entrance of the gullet into the stomach, there is a change of character, and the epithelium loses much of its resemblance to the epidermis, being afterwards nothing more than a series of minute scales covering the villous projections of the membrane.

134. THE NAILS AND HAIR are merely different forms of the cuticle; and of the SEBACEOUS FOLLICLES and PERSPIRATORY GLANDS, the former lubricate the skin, and the latter throw off the perspiration for the purpose of reducing the temperature of the body, whilst the network of nerves constitutes the organ of touch. So in the mucous membrane, wherever epithelium exists, secretion takes place, differing in different parts according to the nature of the scales which form that covering; mucus is one of these secretions, and the most universal, but not invariably present, being chiefly met with near the excretory channels of the various glands. Thus, we have throughout the whole of this large investing membrane, which serves as an envelope, a series of glands, one set secreting the sensible and insensible perspiration; another, the sebaceous matter which lubricates the skin; a third, the hair to serve as a protection and ornament; and lastly, the various mucous glands, and those for other purposes which line the mucous membrane of the body. (See Part III. for a more minute description of each of these parts.)

135. MUCUS is a combination of albumen and alkali, and when healthy is not usually viscid, that property being a sign of irritation in some shape to the membrane itself; and thus we find, on examining any of the mucous surfaces in a state of health, that there is nothing like jelly, or what we commonly call mucus, upon them. There is in the intestines a constant shedding of epithelial scales, which in dissolving give off a mucus of a thick and pultaceous consistence, but not slimy or viscid; and when we see this appearance in any intestinal secretions, we may at once set it down as the result of disease.

136. OTHER FLUIDS are secreted by the glands and villi of the mucous membrane, according to the use of each organ lined by that membrane. Thus, the gastric juice is secreted in the stomach by the glands situated in the membrane lining it; in the same way other and somewhat similar fluids carry on the work of digestion in the small intestines, and these are partly the product of glands, and partly of the villous coat of the small intestines. Any derangement, therefore, of this important organ interferes seriously with the nutrition of the body, and produces some one of the many forms of disease connected with the stomach and bowels.

SECT. 2.—EFFECTS OF INFLAMMATION AND CONGESTION ON THE MUCOUS MEMBRANE AND SKIN.

137. As both of these membranes are very liable to irritation from external causes, so they are often roused to a state of active congestion, and this is followed sometimes by inflammation, without the blood being more loaded with fibrine than natural. This state of active congestion produces an increase of the secretion from the mucous surface, sometimes rendering it very watery and copious, as in the loose evacuations from the bowels, and at others producing that thick viscid fluid which is commonly known as mucus, and which is a complete change of the natural secretion as already mentioned. When the inflammation of the mucous membrane runs very high, and the blood at the same time is overloaded with fibrine, a layer of that substance is thrown out upon the surface of the mucous membrane, assuming the exact form of its interior, and, as it were, making "a cast" of it. Such is the result of the disease known as croup, when it has been allowed to go on unchecked for a few hours. So, again, in inflammation of the bowels shreds of fibrine or lymph are often thrown off, marking a high state of the disease, and a similar excess of fibrine in the blood. Another result of inflammation in the mucous membranes is the secretion of pus, and this indicates the absence of the epithelium which is necessary to the production of mucus. When therefore pus is present on the free surface of a mucous membrane, we may know that the epithelium is removed from a part of its surface corresponding with the amount of the pus. But as mucus often affords to the eye the appearance of pus, it is

only by the microscope that we can with certainty detect the difference between the two, the latter presenting its peculiar pus-globule under the lens. Lastly, blood is often poured out by the vessels of the mucous membrane without an absolute rupture of their coats, but by a species of oozing or straining, most probably from their open mouths. When this comes from the small bowels it is generally of a peculiarly black and pitchy appearance, unlike blood in other parts of the body.

138. The forms of inflammation and congestion which attack the skin are very various, but as we have more opportunities of studying their peculiarities, they are only perhaps *apparently* more so than those of other parts of the body. They are generally described as eruptions, or skin-diseases, and as such I shall here consider them.

CHAP. IX.

INFLAMMATION AND CONGESTION OF MUCOUS SURFACES.

SECT. 1.—CATARRH AND INFLUENZA.

139. When, as the result of exposure to a blast of cold air, called "a draught," the nervous expansions of the mucous membrane lining the mouth, throat, nose, and eyes have been partially paralysed, an increased quantity of blood is admitted into them, with a slow and sluggish current through the vessels, and accompanied by a certain amount of feverish disturbance. This is commonly called an ephemeral fever in the first instance, but, nevertheless, the local condition is one at first of congestion, frequently followed by inflammation of the membrane, and showing its results in a flow of viscid mucus from the cavities of the nose, which is commonly called "a cold in the head." Such is the most familiar form of ordinary congestive inflammation of the mucous membrane, that is to say, of congestion followed by inflammation, which latter process appears to be an effort of the natural powers to get rid of the congestion by a discharge of some of the contents of the vessels.

140. CATARRH (commonly called "a cold") being the type of the inflammations of the mucous membrane lining the air passages, and being exceedingly well known to most of us by practical experience, serves as a comparison with other inflammations of these organs. Nevertheless this catarrh is not always confined to the eyes, mouth, nose, and chest; but sometimes after "catching cold," there is a similar discharge of mucus from the bladder, and indeed lasting the same time, and attended with the same constitutional disturbance. I have frequently known great alarm expressed even by medical practitioners at the appearance of half a pint of purulent mucus in the morning instead of urine, but when unaccompanied by organic mischief in the kidneys, it is sometimes merely a "catarrh of the bladder," which requires only soothing treatment and quiet for a few days to cure itself. It appears that the essence of the disease is congestion of some portion of the mucous membrane, as the result of over-stimulus to its nerves from some cause, which may be the draught of cold air, or an epidemic poison, or any other cause of a like nature. This not only brings on congestion, but also inflammatory fever with it, and the result is either a catarrh of the cavities of the nose, called "a cold in the head," or bronchitis if it attacks the bronchial tubes, or catarrh of the bladder in the case just described.

141. INFLUENZA is an epidemic catarrh, usually ending in bronchitis. The whole mucous membrane is poisoned, the appetite goes, there

is first a "cold in the head" then bronchitis, and all along flatulence and loss of tone in the stomach, with great prostration of strength. The difference from ordinary catarrh is solely in the violence of the symptoms, and in the great prostration of strength, all of which seem to depend upon some poisonous element in the air, of the nature of which we know nothing, and of its effects only that they are epidemic. By these circumstances only can influenza be known from catarrh.

142. With regard to the precise condition of the mucous membrane in either of these states, when we inspect the membrane in a part which is visible, we find, as in the front of the eye, where the conjunctiva is naturally white, that after exposure to a draught of cold air, it is covered with a network of vessels carrying red blood, its arteries and veins being so dilated from the effect of the over stimulus, that they no longer refuse to admit the red globules of the blood, but allow them to pass into their canals; so again with the throat, under similar circumstances, its membrane is no longer pale and thin, but it is become puffy, red, and shining, and is evidently spongy with blood.

SECT. 2. — LARYNGEAL AND BRONCHIAL INFLAMMATIONS.

143. Very frequently the above condition of this part of the mucous membrane extends downwards through the larynx to the trachea and bronchial membrane, producing sometimes active inflammation of the larynx, called LARYNGITIS; or when passing over this part it "settles" on the membrane lining the smaller tubes, it is called BRONCHITIS, a term which is now in very common use. In this transit there is almost always a period of time during which the larynx suffers acutely, although often of short duration. There is then considerable pain in speaking, and often hoarseness, or entire loss of voice above the whisper, together with a short hacking cough, which is exquisitely painful. After this has disappeared, from the progress downwards of the disease, the cough is the prominent symptom, which is at first harsh and dry, and accompanied by more or less pain in the effort, referred either to the root of the throat, or often to the muscles of the chest or abdomen only. Sometimes the respiration is not disturbed, being quite free in the intervals of the cough; while at others it is more frequent than natural, together with some difficulty in the inspirations, the sensation being described as like breathing through a sponge. On taking a deep and slow inspiration, there is no pain felt, except from the soreness already described as attending on the cough. After a short time, varying greatly in different cases, an expectoration of a white and frothy mucus commences, which gradually becomes more and more yellow, and often at last cannot be distinguished from pus. Blood is sometimes also mixed with this in small streaks. As it progresses, the symptoms gradually disappear, and the parts return to their natural state; or, on the other hand, the breathing becomes more and more difficult, the membrane fills out with blood, and becomes more and more swollen, so as to impede the admission of air, and the patient dies suffocated, the sticky mucus aiding the puffy membrane in filling up the tubes. Such is the regular type of the disease known as acute bronchitis; but there are also the forms known as *chronic bronchitis*, *spasmodic bronchitis*, or *asthma*, and *senile bronchitis*, as well as that epidemic and contagious form of bronchitis known by the name of *hooping-cough*, and common among the young people of this country.

144. CHRONIC BRONCHITIS is generally a remnant from the acute form, but sometimes it comes on without any previous stage of that disease. This is what is commonly called "a cough," in that stage which exists beyond a few days or a week, and especially where it assumes the form known as "a winter cough." When the disease is of long standing, and

there is a copious secretion of a viscid yellow mucus, especially in the morning, the disease is commonly known by the name of "humoral asthma." In chronic bronchitis, the expectoration may be of any variety, from the thin frothy form of mucus, like beaten white of egg, to the thick purulent secretion which I have just mentioned as met with it in humoral asthma. There is often difficulty of breathing, and every variety of cough, from the loose easy kind to the tight and barking form, which is so distressing both to the sufferer and his friends. The pulse is seldom much affected, and there is no fever, but the strength suffers considerably in many cases. Unless there is a complication with tubercular disease, this form of bronchitis is seldom fatal.

145. In Spasmodic Bronchitis, the chief peculiarity consists in the suddenness of the attack, which often comes on in the course of half an hour to such an extent as apparently to threaten life. The patient may be left quite well, and in half an hour he may be found leaning over the back of a chair gasping for breath, and with his eyes starting out of his head, and a general appearance of distress, which is most trying to the inexperienced witness. There is a feeling as if a cord was tied round the upper part of the chest, threatening immediate suffocation; the speech is low and difficult, for want of breath; the skin is pale and cadaverous, but covered with perspiration, and the lips as well as the tips of the fingers blue. All the muscles of respiration may be seen in violent action, and the recumbent position is wholly out of the question. If the breath is held for a second or two by a powerful effort of the will, a single full inspiration may be made, which is not the case in the last stages of ordinary bronchitis. This relief, however, is so transient as to be of no use to the patient, and only serves to assist in the diagnosis. In spite of the severity of the symptoms, if the heart is not diseased, and the lungs are otherwise sound, asthma very seldom ends fatally, unless neglected, or the remedies used are so powerful as to be necessarily attended with injurious results. The disease consists in congestion of the mucous membrane, together with spasm of the posterior fibres of the bronchial tubes; and there is seldom any subsequent inflammation of an acute character, the chief sequel being a low chronic bronchitis, with a liberal flow of frothy mucus.

146. Senile Bronchitis is a form of chronic bronchitis which attacks old people, attended with the usual symptoms, but in a very obstinate manner. It often attacks old people in several successive winters, and finally carries them off by an accumulation of mucus, which they have not strength to expectorate.

147. Hooping-cough is undoubtedly a contagious disease, and is probably also epidemic in its character. By many it is supposed to be wholly of a nervous origin—that is to say, unconnected with any ordinary inflammation of the parts which are apparently the seat of the disease. This, however, is a purely theoretical opinion, and is founded chiefly upon the fact that the cough continues beyond the time when there are any bronchial changes to account for it, and also that its nature is different from any other, commonly accompanying simple bronchial affections. It appears to me that the evidence is strongly in favour of its being an inflammation of a particularly low kind, very closely allied to passive congestion, and accompanied in its latter stages by spasm of the glottis. It may be considered as—1st, simple congestive hooping-cough, which is the type of the disease; and, 2nd, inflammatory hooping-cough, which is accompanied by active inflammation of the lungs or bowels, or sometimes by disease of the brain.

148. Simple Congestive Hooping-cough generally begins with all the symptoms of an ordinary cough, lasting from ten days to three weeks. At the end of this time a slight "whoop" is heard now and then, by which the experienced ear at once detects the

nature of the disease. The whoop is made after two or three, often even more, violent short expiratory coughs, when, the face being already turgid with the effort, a long and peculiar inspiration is made, as if the breath were drawn with difficulty through a vibrating substance, giving out a ringing crow. Presently another series of coughs is given, followed, as before, by a whoop, and then, or perhaps after a third fit, the contents of the stomach are vomited up, and there is an interval of rest for some short time. Very often there is with the vomiting an expectoration of stringy mucus; sometimes the straining is so severe, as to occasion bleeding from the nose, or from the membrane of the eyes, the mouth, or bronchial tubes. In the intervals the child is free from fever, and eats and sleeps well. The number of these paroxysms in the day varies greatly, sometimes occurring three or four times only in the twenty-four hours, and at others tormenting the child every half-hour. When this stage of the disease, in which the whoop is developed, has lasted about three weeks, it begins to decline, the paroxysms becoming less violent, and the intervals between them longer, and generally in about three months the disease wholly disappears; but, on the slightest "cold," it is apt to return; and, on this account, great care should be taken to avoid any chance of such an event by every possible precaution short of confinement to the house, which is prejudicial, from its effect upon the general health. Hooping-cough, if uncomplicated by other diseases, is not attended with much danger, except to very delicate young children. It is also very rarely to be met with attacking the same person twice.

149. INFLAMMATORY HOOPING-COUGH may be considered as the result of the same contagion as congestive hooping-cough, but attacking children whose blood is loaded with fibrine, and therefore predisposed to inflammation; while those whose blood is in a perfectly healthy state, although the containing vessels are dilated from the influence of the poison, so as to produce congestion in the first stage, and spasm with it in the second; yet they do not go farther, and there is no deposit of lymph in the substance of the lungs, nor is there any effusion of serum under the surface of the mucous membrane, as sometimes occurs in the bronchitis of hooping-cough. When, therefore, we find *in the intervals of the cough* that the breathing is still hurried, and that there is a rattling noise in the chest, with working of the nostrils, and a good deal of feverishness, we may generally conclude that there is more or less inflammation of one or both of the structures implicated in bronchitis and pneumonia. It is seldom, I believe, in this disease that one is affected without the other, and if there is this inflammatory tendency in the blood both will be sure to suffer more or less. The stethoscope detects these conditions by the usual symptoms—for which see *Pneumonia*. Such an attack should never be left to the care of any but the experienced practitioner.

150. Inflammatory Hooping-cough may be complicated with diarrhœa, in which case there is generally remittent fever accompanying the two, and the symptoms are those of that disease, with the addition of this peculiar cough. It is a most severe and dangerous state of things, and requiring very careful treatment.

151. HOOPING-COUGH occurring in children predisposed to convulsions, or any other disease of the brain, is very apt to produce them, in consequence of the strain upon that organ; it may, however, be considered as only producing them by the mechanical pressure which it causes upon the vessels of the brain. Such a complication adds greatly to the dangers of the case, and to the difficulty of treatment, in consequence of the necessity for guarding against the mischief in that important organ, the brain, as well as against the general weakness attending always upon the disease.

152. LARYNGITIS AND CROUP.—Just as the various inflammations of the mucous membrane lining the *bronchi* have received the name of *bronchitis*, modified by the adjectives acute, chronic,

spasmodic, and senile, so the corresponding disease when attacking the *larynx* is called *laryngitis*, which also may be acute or chronic; and if the *trachea* is the seat, then the name *tracheitis* is attached to the disease, or, in common English, *croup*.

153. Acute Laryngitis is a most severe and dangerous inflammation of the larynx, preceded and accompanied by inflammatory fever. It begins by hoarseness, with a husky, painful, and convulsive cough. The larynx when pressed is sore, and the pressure generally brings on the cough. There is generally some degree of "sore-throat," and the fauces look swollen and red. The breathing soon becomes difficult, the countenance shows anxiety, the recumbent position occasions a sensation of suffocation, the lips are blue, the skin elsewhere either pale, or, if the colour is "settled," of a livid hue; the pulse quick and hard, the voice soon is reduced to a whisper, and the respiration becomes speedily so laborious as to threaten suffocation, which rapidly takes place if relief is not afforded. The usual period elapsing before death is about three or four days, but a shorter interval has often sufficed, and hence the friends of a patient so situated should lose no time in obtaining advice. The seat of the disease is the mucous membrane lining the interior of the larynx, which becomes injected with blood, and beneath its coats serum is effused in the cellular membrane attaching it to the cartilages and muscles of the larynx. This is a very peculiar condition, and more marked here than in any other situation; but perhaps it is more carefully noticed here, because its presence is so seriously prejudicial to life, from the swelling in so confined a space more or less obliterating the channel for the passage of air. Hence the amount of effusion (called *œdema*) may be considered as the important feature in the disease. It can readily be distinguished from bronchitis by the absence of the signs of that disease, as evidenced on examining the chest, and by the presence of the severe local pain and the complete loss of voice; from croup, also, it is easily known, by the want of the peculiar sound given out in that disease, as we shall presently find. The *cause* is generally exposure to cold in a subject predisposed to inflammation.

154. Chronic Laryngitis presents the same local symptoms, but in a less marked degree, and unaccompanied by the fever and distress which are so urgent in the acute form. It is an affair of weeks or months instead of days. and there is generally some little expectoration of yellow or blood-stained muco-purulent fluid. There is the same thickening and inflammation of the membrane; and in the later stages it ulcerates, the loss of substance sometimes extending to the cartilages of the larynx. The cause is often to be found in the combined effect of spirit-drinking and exposure to the weather, as in the hackney cabmen of large towns, who are peculiarly subject to its ravages. Also, in some forms of phthisis, the disease seems to commence in the larynx by ulceration without previous inflammation. The peculiar stridulous voice, without any signs of disease of the chest, will generally serve to detect this chronic form of laryngitis.

155. Croup is the most common of all active inflammations of the mucous membrane of the air passages, except bronchitis. It is said to reside in the trachea alone, but the inflammation always extends in some degree to the larynx. It appears to depend upon the excess of fibrine in the blood, which leads to a rapid pouring out of lymph, rather than to any precise spot which is liable to the inflammation. Where this exists, as in many strong, hearty children, on the slightest "cold," the mucous membrane takes on this kind of inflammation, and a thick layer of of white curdy-looking membrane is thrown out on the inside of the trachea and the lower part of the larynx. The consequence is, that the hoarseness and wheezing attendant upon simple inflammation are soon followed by such a harsh rasping noise in breathing, that the child may be heard from one room to another. It may be compared to a rapid snoring, more nearly than to any other familiar sound, but it is not

exactly like, nevertheless, being less coarse and sonorous. By and by this noise becomes more metallic; and, if unrelieved, is most distressing, and is accompanied by great struggling for breath, with anxiety of countenance, a constant short cough, which partakes of the same sound as the breathing, and blueness of the lips and hands. Towards the last some portions of the white membrane are often dislodged, and occasionally long and perfect tubes are brought up, which exactly correspond with the interior of the trachea or bronchi. Their dislodgment gives great temporary relief, but if the remedies used are not equal to the occasion, more lymph is given off, and suffocation closes the scene. It is a disease of early life chiefly, though sometimes occurring after the adult period. Those who have had one attack are peculiarly liable to others, and it is very apt to run in families. It runs its course so rapidly, that the loss even of an hour or two will often be fatal, the average duration of the disease being about forty-eight hours. The peculiar noise once heard will always detect the disease.

156. Spasmodic Croup differs from genuine croup, in being merely a symptom of other diseases, and in not being of an inflammatory character. It has, however, similar paroxysms, in which there is a great noise made in the throat; the difference being that these are not permanent, but leave the child at intervals quite free. It comes on as a result of irritation of some kind, generally that of teething, or worms, or in hydrocephalus; and it cannot be considered as an inflammation, but rather as a species of spasm.

Sect. 3.—Inflammation of the Mucous Membrane of the Stomach and Bowels.

157. Gastritis, or inflammation of the mucous membrane of the stomach, like most other diseases included in this chapter, may be either acute or chronic. The former is rarely met with, except as the result of poison, the symptoms attendant on which are given under the head of *poisons*. Sometimes, however, we meet with acute gastritis in the adult; and in the infant it is not unusual to meet with it, showing itself in one of the many forms of "thrush." The symptoms are a burning pain in the pit of the stomach, increased on pressure and after swallowing food; constant vomiting, frequently hiccup, entire loss of appetite, accompanied by a sensation of sinking, and great prostration of strength; pulse quick, hard, and wiry; excessive thirst; tongue red and glazed, as if skinned; countenance anxious, sleep disturbed, and some inflammatory fever, not very high. In infants, the whole inside of the mouth is covered with patches of white lymph, the intervals being red and shiny. In the early stage there is generally constipation, but afterwards profuse diarrhœa often sets in, the motions being green and offensive. Chronic gastritis differs only from the above in the symptoms coming on more gradually, and with less severity. There is also seldom any hiccup, and the pain on pressure is not so severe. It is generally the result of bad diet, and in neglected children is a common disease.

158. Diarrhœa and Dysentery are terms used loosely by medical writers to describe any unusual flow from the bowels of thin fæces, watery fluid, or mucus; but the majority attach to diarrhœa the meaning of a milder flow, chiefly arising from the small intestines; while the term dysentery is confined to those inflammatory states of the large bowels which produce a discharge of bloody mucus, or sometimes of watery fluid mixed with shreds of lymph. Diarrhœa, in fact, may be said to consist in a state of congestion, either active or passive, of the mucous membrane of the small intestines, as well as often of the large; while dysentery properly means an inflammation chiefly of the lower bowels, accompanied by a secretion of fibrinous matter in the shape of lymph, and arising from the peculiar state of the blood, or from epidemic causes acting on it.

159. Diarrhœa, in its mildest form, seems to be merely dependent upon

excessive irritability of the absorbents of the small intestines, so that they refuse to take up the liquid elements of the food, but pass them off through the canal. Another form depends upon excessive action in the membrane depending upon mental excitement, after which a large quantity of fluid is thrown off, in the same way as in the sweat of fear. While, again, we have a form of diarrhœa, in which, from a want of tone, the vessels of the part give out their watery particles by a kind of oozing. But beyond these we have the active congestion produced from the irritation of an unwholesome diet, or from excess in quantity either of eatables or drinkables, and especially from large quantities of food. These seem to cause an increased flow of blood, followed by a large secretion of watery fluids, or often of excrementitious matters, and of bile in particular. When there is a thick tenacious mucus in large quantities, and especially if stained with blood, there is evidence of intense congestion of the mucous membrane from the irritation of food, or from that of hardened fæces, called *scybalæ*. In the latter stages of phthisis, and some other diseases, there is such a want of tone in the vessels that they give way, and their contents pour out in large quantities, producing a fearful depression, and if not checked speedily ending in death. Diarrhœa may be distinguished from inflammation of the bowels (the serous coat), by the absence of pain on pressure of the abdomen, which generally affords relief in this disease, while in the case of inflammation of the serous membrane, the pain is frightfully aggravated by it. With these various forms of diarrhœa, it may be considered desirable to class them according to the nature of the evacuations, as—1st, simple diarrhœa, in which the motions are healthy in character, but much too loose; 2nd, bilious diarrhœa, in which there is an excessive flow of bile acting as a purgative; 3rd, watery diarrhœa; 4th, mucous diarrhœa; and, 5th, the diarrhœa with frothy white motions, in which bile is wholly absent. These will all require different treatment, to be hereafter alluded to.

160. DYSENTERY, as I before remarked, consists in inflammation rather than congestion of the mucous membrane of the lower intestines. The usual definition of the disease is as follows:—Frequent mucous stools, often stained with blood, pain in the abdomen, griping, and an ineffectual straining, called *tenesmus*, which is peculiarly distressing. There is some little fever and great prostration of strength; and, in most cases, there is an epidemic cause for the disease. We have here, also, every shade and variety of intensity, from the mild dysentery of temperate climates to the frightful diseases known and dreaded in tropical regions. In this country it usually commences with liquid feculent evacuations, which soon become mucous, and are often tinged with blood. There is frequent griping and tenesmus, but no fixed pain in the bowels. There is generally slight fever and some thirst, but not to any great extent. This goes on for seven or eight days, and is seldom attended with fatal results. Sometimes, however, it has prevailed epidemically, and then the discharges have been beyond the restraining powers of medicines, and the strength has been exhausted in a few days. DYSENTERY IN HOT CLIMATES is thus described by Sir George Ballingall:—"The evacuations are generally copious, of a fluid consistence, without any peculiar *fœtor;* sometimes streaked with blood, and at other times a small quantity of blood is voided in a separate form, unmixed with the fæcal matter. The pulse in this stage of the disease is seldom altered, the heat of the skin is not perceptibly increased, and the tongue is frequently but little changed in its appearance. There is always a great prostration of strength and depression of spirits, the former symptom being always strongly dwelt upon by the patient, the appetite is indifferent, and the thirst urgent. To these symptoms succeed a fixed pain in the hypogastrium, more or less acute, the pain extending to, and peculiarly

urgent in, one or both iliac regions, and sometimes to be traced along the whole course of the colon, with a sense of fulness, tension, and tenderness upon pressure; and, on applying the hand to the surface of the abdomen, a preternatural degree of heat is frequently perceptible in the integuments. The evacuations now become more frequent, and less copious; they consist chiefly of blood and mucus, or are composed of a peculiarly bloody serum, which has been very aptly compared to water in which beef has been washed or macerated. A suppression of urine and distressing tenesmus now become urgent symptoms, the indifference to solid food increases, while there is an incontrollable desire for liquids, particularly cold water, which the patient prefers to any drink which may be offered to him, and from which he expresses his inability to refrain, though prepossessed with the idea of its being injurious. The tongue is now generally white and furred, sometimes, however, exhibiting a glassy, smooth, and florid appearance, with a tremulous motion when thrust out; the skin is either parching hot, so as to render it even painful to retain the hand in contact with it, or covered with profuse perspiration, insomuch that it may often be observed standing in large drops on the surface; the pulse is still frequently but little affected; sometimes, however, it assumes a febrile quickness, without any other remarkable feature; at other times it will be found without any increase of velocity, but full and bounding, with a peculiar thrilling sensation under the fingers. This state of the pulse, whenever it takes place, always denotes extreme danger, and shows that the disease is rapidly hurrying on to the final stage, in which the lassitude and dejection so conspicuous throughout its course are now converted into the utmost degree of anxiety, depression, and fear of death. * * * The discharges by stool, which are frequently involuntary, are now accompanied by the most intolerable fœtor; they are frequently mixed with shreds of membrane, and quantities of purulent matter. A protrusion of the gut, forming a complete *procidentia ani*, takes place; and cases are not wanting where a portion of the inner coat of the intestines, amounting to some inches, has been thrown off in a state of mortification." Those who have seen the disease in this country will easily trace the resemblance, though so much aggravated in degree.

161. English Cholera (common or sporadic) may be defined as consisting in vomiting and purging of liquid matters, more or less tinged with bile. This is accompanied by spasmodic pain in the stomach and intestines, and by cramps, which are sometimes in the muscles of the abdomen, at others in those of the limbs, and occasionally in severe cases in both. When the disease has lasted without relief for thirty-six or forty-eight hours, collapse sometimes comes on, being similar in its nature to that following any ordinary loss of the fluid part of the blood. The *nature* of the disease appears to consist in great congestion of the mucous membrane of the stomach and bowels, and also of the liver, as well as in some cases the kidneys, all of which at first refuse to act, and then gush forth most copiously. It is common enough in this country, and especially in the autumn, which has led to its being associated with the prevalence of fruit at that time; but it is doubtful whether it can be often attributed to that cause. Its *cause* is wrapped in mystery; but most probably we owe it to some mysterious condition of the air, and sometimes to errors in diet. It may, however, be assumed from well-known facts, that in bilious cholera the disease is mainly owing to an excessive collection and subsequent discharge of acrid bile, which first of all induces sickness from its collection, and afterwards diarrhœa by its irritating quality. On the other hand, in the worst form, where there is no bile, the probability is that the cause must be looked for in some peculiar poison imbibed. This disease is not often fatal, and especially the bilious variety.

162. Asiatic Cholera differs only

from the worst kind of sporadic cholera in being epidemic. It is sometimes called *spasmodic* from the violence of its spasms, or *blue* from the colour of the skin, or *malignant* from the fearful mortality which it occasions. Its symptoms vary, as seen in different countries and in succeeding epidemics, quite as much as each of these does from cases of sporadic cholera observed before and since the first advent of the disease. It may be well considered as consisting of three stages—1st, the *premonitory*; 2nd, *the cold stage*, or *stage of collapse*; 3rd, *the stage of reaction*, or in which fever is developed. In the premonitory stage *diarrhœa* is almost invariably present, and this fact is of great importance to be known, since it is in this stage only that much control can be exercised over the disease. At first the motions are tolerably natural, though loose, but they soon assume the appearance of rice-water, and are passed in large quantities without griping, and generally without sickness, except that sick sensation which always accompanies excessive weakness, and this is a prominent feature. This stage lasts, on the average, forty-eight hours, though sometimes not more than eight or ten elapse between the first loose stool and the advent of the collapse. *The symptoms of the cold stage* are very various, the chief and peculiar set of them being the extreme prostration of strength, coldness, *lividity*, and loss of pulse. There is generally more or less vomiting and diarrhœa of rice-water, but this discharge is sometimes wholly absent, and at others is only partially present; sometimes it is squirted out from both orifices, as if from a syringe; and in these cases spasms or cramps are almost always present, both in the abdominal muscles and in those of the limbs. There is a frightful sensation of sinking at the stomach, without much pain, and the patient is almost always persuaded of his great danger, and ready to allow of any remedies being used. After eight or ten hours, on the average, the vomiting and purging cease, and the sinking and exhaustion go on increasing. The cramps now generally cease, or, if they are not wholly gone, they are comparatively mild. There is no perspiration or discharge of urine, and the whole of the natural secretions seem suspended. Death now takes place from the cessation of the action of the heart, which gradually leaves off its functions, the pulse and the respirations becoming inaudible as well as invisible some time before death, and the skin being cold, clammy, partly pale, and partly of a livid hue; at the same time the voice sinks to a childish whisper, and the muscular power of the limbs is wholly gone. If, however, the powers of the system are enabled to throw off the disease, a reaction now sets in, and the third period, that of *febrile excitement*, commences by a gradual warming of the extremities, a return of the circulation, and in most cases a secretion of bile showing itself in the motions. In some cases these symptoms are soon moderated, and convalescence begins on the second or third day; but in severe ones, a typhoid fever of a dangerous type sets in, and many deaths take place at the end of a week or ten days. The *nature* of the disease appears to reside in some extreme congestion of all the most important internal organs, but particularly of the liver, bowels, and stomach, together with a prostration of the nervous system, which is probably the immediate precursor and cause of it. *Post mortem* examination shows little or nothing more than a change in the mucous membrane, but there is reason to suppose that an effect is produced upon the nerves and the blood by some poison existing in the air, and that this has a greater effect when the body is reduced by bad living, or by any other depressing influence, such as defective drainage. The disease first appeared in this country in 1832, then left us till 1849, when it again disappeared; but we had a cessation only till 1854, in which year the epidemic prevailed in London to a more frightful extent than before; but the spread over the country was not so general. Long before the first outbreak in modern times, in India extensive epidemics of a similar character had been noticed by medical writers, one of which was as late as the seventeenth century; but none appear to have been as widely extended in their depredations, or as fatal as the modern Asiatic cholera. There can be no doubt that in some way the disease spread from the Ganges to the Thames, and its course can be readily traced, but whether by contagion or by epidemic influence, whatever that may be, or by both, remains to this day a disputed point. It has been conjectured by Dr. Snow, that the disease is propagated by the fluids ejected passing into the rivers or into the general water supply, in whatever form that may be effected, and that in this way there is really a contagion effected in the most simple manner. It is certainly very remarkable that in so many instances the disease should have followed the course of the great rivers; but there are too many exceptions to allow this to stand as a rule, and we find that the outbreak has often occurred in a spot which has no river of any size that could have brought down the poison. That the disease will recur again and again at uncertain intervals is more than probable, and perhaps in time we may learn something of the laws which govern its progress, and of its exact nature and cause—points on which we really know nothing at present.

SECT. 4.—INFLAMMATION OF THE MUCOUS MEMBRANES LINING THE ORGANS WITHIN THE PELVIS.

163. INFLAMMATION OF THE BLADDER may be either *acute* or *chronic*. In the former case it is generally either a species of catarrh (see page 47), or else it is the result of some accidental and local cause. In any case the symptoms consist in a severe pain in the lowest part of the abdomen, with a constant desire to pass the urine, which, when passed, is more or less cloudy or milky, and after "settling" shows a considerable layer of pus or mucus at the bottom. There is often fever and sometimes sickness. *Chronic inflammation of the bladder* is attended with less marked symptoms of irritation, and is often without pain; but there is almost always more or less purulent deposit and difficulty in passing the water. It is either the result of acute inflammation, or it is caused by the mechanical irritation of gravel or stone, or sometimes in very delicate children it comes on apparently without any local cause, when it appears to be a sign of general debility.

164. INFLAMMATION OF THE URETHRA, which is the passage through which the urine is discharged from the bladder, is a very common disease in both sexes, and arises from many causes, being sometimes connected with either of the above forms of inflammation of the bladder, or from the lodgment of small calculi in the passage, or from other causes depending on excesses of various kinds. There is more or less contraction of the passage (stricture) which may be either permanent or spasmodic, and in proportion to this is the difficulty of passing the urine. In all such cases, however, the aid of a skilful surgeon should at once be called in, since there is no time to be lost; and if delay takes place mischief which might easily be relieved in the onset, soon becomes of a most formidable character.

165. INFLAMMATION OF THE MUCOUS MEMBRANE lining the womb and vagina is very common at all ages, but it varies greatly according to the period of life. It is attended with a discharge of mucus, which is generally of a whitish colour, whence it has received the names of *leucorrhœa*, *fluor albus*, and *whites*; but these names are now applied to the disease whether the discharge is white, yellow, greenish, or brownish—all of which colours are sometimes found imparted to it. So much in these cases depends upon the exact cause, that it is always right to investigate it with great care; and if it continues, the advice of a medical man should invariably be obtained. If, however, it is merely a sign of weakness, as is generally the case before the age of twenty, attention to the general health, with change of air, may be all that is necessary. It may be connected with organic disease of so many different kinds, that it is quite useless to attempt to enumerate them here; and in

such cases the application of remedies which would be of use in simple leucorrhœa would aggravate the more deeply-seated disease tenfold. In young girls there is very often an acute inflammation of the vagina, apparently caused by cold, and resembling in character the catarrh of the bladder. Here the discharge is yellow, and very irritating, so as to produce erythema of the adjoining skin. This fact should be recognised, for many reasons.

SECT. 5.—INFLAMMATION OF THE DUCTS OF GLANDS.

166. The mucous membrane lining the ducts which convey the secretions of various glands is apt to inflame, or become congested, from various circumstances, which irritate the gland itself, and then the swelling of the membrane will sometimes interfere with the discharge of the fluid through the duct. Thus, we often find great impediment offered to the free passage of the milk, when the breasts are first called into active service after delivery, and this is mainly the effect of congestion in the mucous membrane. In a perfectly healthy condition, and *in a state of nature*, no such defect would occur in the machinery; but, in the present day, owing to the pressure of stays and other causes, such is often the first trouble of the young mother. When it exists, the milk as it is secreted remains lodged in the glandules or little subdivisions of the gland, and the whole breast swelling from the retention, it is said to be "wedged." In the same way, though on the small scale, the sebaceous follicles become blocked up by the secretion collecting in them; but in this case the defect is more in the secretion itself than in the narrowness of the tube. Here the matter, which is intended to be a mucilaginous oil, is converted into a cheesy curd and instead of passing out of the tubes and fulfilling its office, it remains within them, distending them to three or four times their natural dimensions, and ultimately causing inflammation, and a peculiar eruption called *acne.* In the salivary glands, a similar condition of one of the tubes leads to a collection of the saliva in it, and *ranula* is the result, presenting the appearance of a bladder of water under the tongue. Each of these diseases will, however, be better alluded to under the particular organs implicated.

CHAP. X.

INFLAMMATION AND CONGESTION OF THE SKIN.

SECT. 1.—NOSOLOGICAL ARRANGEMENT OF SKIN DISEASES.

167. A portion of these diseases has been described under the head of Eruptive Fevers, for the reason that in their cases the fever is the marked and prominent feature, while the eruption is only subsidiary. Here, on the contrary, we have to consider a set of inflammations and congestions of the skin, which are often wholly unattended with fever, or with any apparent constitutional disturbance. It is also true, that sometimes there is little or no inflammation or congestion, as far as we can discover; and indeed some few will be here placed which are purely of a nervous character (that is to say, of the cause of which we know nothing); but, for convenience sake, they are grouped with the others, being few in number, and unworthy of a distinct place. Many attempts have been made to arrange these skin diseases, and various plans have been adopted, but they run into one another so much, and the divisions are so arbitrary, that the arrangement is wholly useless. Thus, one and the same eruption may be watery this week, purulent the next, and scaly the week

after; so that it would be difficult to say to which of the three divisions it ought to be assigned, which are known as vesicular, pustular, and scaly. For this reason, I shall make little or no attempt at any such grouping, but shall describe them one after the other, beginning with the most simple, and merely throwing some of the most marked into their natural places, whilst those subject to variation will be placed in a separate section. Mr. E. Wilson's arrangement, depending upon the particular tissue attacked, is, perhaps, the most scientific; but, to the ordinary observer, in his plan there are insuperable difficulties, because in many individual cases the eruption is not confined to one structure, but extends to others. Still, in the main, his arrangement is worthy of imitation, remembering always that it is an artificial one, since, as I said before, particular skin diseases are not confined to particular tissues.

168. In order to understand the descriptions contained in this chapter, we must first investigate the meaning of the words, *papula* (or *pimple*), *vesicle*, *pustule*, *scale*, and *parasite* (animal and vegetable), which will be presently described at the head of their respective sections.

169. MR. WILSON'S ARRANGEMENT being based upon the division of the skin into *derma*, *glands*, and *hair follicles*, he divides skin diseases into four primary groups—

1. Diseases of the derma (including, as a matter of course, the epiderma).
2. Diseases of the perspiratory glands.
3. Diseases of the sebaceous follicles.
4. Diseases of the hairs and hair follicles.

These, again, are subdivided by him. Thus, the first comprehends inflammation of the derma, hypertrophy of the papillæ of the derma, disorders of the vascular tissues of the derma, disorders of the sensibility of the derma, and disorders of the chromatogeuous function of the derma; and, beyond this, he goes still further to arrange the inflammations of the derma, as—*a*, congestive; *b*, effusive; *c*, suppurative; *d*, depositive; *e*, squamous; and, *f*, inflammation, from the presence of acari. It may, however, be useful to comprehend at one glance all these subdivisions, after which it will be found that, in examining them in detail, none or very few are strictly to be included under those given by him. It is, no doubt, more scientific than the old system of Willan, in which skin diseases are divided into eight groups, founded upon the form of the eruption, thus:—

1. *Papulæ* (pimply eruptions)
2. *Squamæ* (scaly eruptions).
3. *Exanthemata* (those with rashes).
4. *Bullæ* (accompanied with blebs).
5. *Vesiculæ* (those with vesicles).
6. *Pustulæ* (with pustules).
7. *Tuberculæ* (tubercular eruptions).
8. *Maculæ* (spots).

It remains, therefore, for me to describe nearly in the order followed by Willan's arrangement, being as convenient as any, those eruptions which are the most common, and which are likely to come under the consideration of the master or mistress of a family. It is, of course, quite useless to include here the more rare eruptions, since they can only occasionally be seen even by the members of the medical profession, and occur so seldom, that a knowledge of them to those out of its pale is wholly useless, and only likely to lead to confusion.

SECT. 2.—RASHES.

170. RASHES are known scientifically by the term *exanthemata*, which is applied to them in common with the eruptive fevers, scarlatina, measles, &c. Here, however, the word is intended to comprise those inflammatory conditions of the skin in which there is a temporary redness in variously shaped patches, disappearing on pressure for the moment, and all ending in more or less perfect desquamation of the cuticle. There is in all of them a variable amount of sympathetic fever, which may assume a highly inflammatory form, or may, on the other hand,

be of a very low type, and resembling typhus in its character. Under this section will be described *erythema*, *erysipelas*, *roseola*, and *urticaria*.

171. ERYTHEMA consists in patches of a red colour, and of variable forms, disappearing for a second on pressure of the finger, and accompanied by very trivial swelling, heat, or fever. It terminates either by what is called resolution, or by desquamation of the cuticle, or by an exudation of a disagreeably smelling watery discharge. The eruption puts on many different appearances, the most familiar of which is the form of erythema, so common among young children when the folds of the skin are not well washed and dried. This neglect produces what is called "chafing," but which is really the result of irritating secretions. Under the name are also included several other varieties, called respectively papular, tubercular, erythema nodosum, &c. Two or three forms are familiar to all those who have seen much of disease, and these are—1st, the erythema which comes on in young persons over the back, shoulders, and face after eating or the excitement of dancing; 2nd, that which accompanies teething; and 3rd, the form of erythema which is caused by any irritating discharge, such as that of the tears, when of an acrid character and running over the cheek, or that which accompanies the discharge from the bowels in diarrhœa, if allowed to remain in contact with the skin; or again, in those cases where there are involuntary discharges of fæces and urine, and the skin is inflamed by them. Besides these three, the form known as *erythema nodosum*, is rather common among delicate young girls, especially after scarlet fever or measles. It appears on the legs in circular *raised* patches, or lumps of the size of a shilling or half-crown, and occasionally also on the arms. It is a disease accompanying debilitated states of the system, and altogether unlike the other forms of erythema in appearance, as well as apparently in its essence, and the causes which produce it. Another form very common on the face of middle-aged people, especially sedentary women, is the *erythema tuberculatum*, often called erysipelas, but quite distinct from that disease as now described. In this erythema there is no rapid tendency to spread, little or no constitutional fever, and no danger, while exactly the reverse occurs in erysipelas. The diagnosis is very important, and many people are alarmed by the fear of erysipelas, when the disease is only erythema.

172. ERYSIPELAS (or *St. Anthony's Fire*) may be distinguished from the last described disease by any experienced eye, but to the novice the task is more difficult; and the exact points of difference are by no means easy to define. Indeed, it may be safely asserted that the two diseases run into one another—that is to say, that there are some cases in which it would be difficult to say to which disease they rightly belong. The usual definition is " an inflammation of the skin, either alone or combined with that of the subjacent cellular tissue, accompanied with symptomatic fever, and generally, though not always, by a vesicular eruption in large blebs, which is followed by desquamation of the cuticle." Here, then, we have two points of difference from erythema, viz., the constitutional disturbance and the vesicular eruption; but these are not always present *at all periods* of the disease, and hence it requires experience to detect the nature of it, if it is examined in their absence. If, however, a *recent* reddish-brown eruption is seen, and presenting its surface raised above that of the healthy skin, with *an abrupt edge*, and with more or less general swelling as well as constitutional feverishness, it may at once be pronounced to be erysipelas, even though there are no vesicles. One peculiarity of this disease is its tendency to spread at its edges, so that very often it will extend from a small patch to the whole of one side of the face in a few hours. There is generally a peculiar burning sensation in the skin, especially in the early stage. The fever varies from the inflammatory kind to the typhoid, and there are all the peculiar symptoms of each when present. Erysipelas is either self-produced

(idiopathic) or the result of some injury (traumatic).

173. Idiopathic Erysipelas generally first attacks the face, though in some few cases it commences in the extremities. Wherever it occurs, it begins by a slight burning or pricking sensation, which is limited to a small space, that very often being the wing of the nose. This is rubbed most probably by the sufferer; but, whether or no, it soon becomes swollen and red, at first with a faint blush, which soon deepens in colour, and has a peculiar though faint shine or gloss. There is at first a very slight raising of the edge, but after a few hours this may be seen or felt, and the abrupt line of colour also. The progress of the inflammation may be rapid, so as to cause the whole face and head to swell to a great size in the course of forty-eight hours, or it may take a week or more to extend over that surface. The features, in bad cases, are all lost in one shapeless mass of swelling, the eyes being closed, and the nose on a level with the cheeks, or nearly so. In such cases there is considerable fever, with a full pulse at first, furred but moist tongue, hot skin, delirium, and cessation of the secretions. After two or three days, in erysipelas, the cuticle is raised by the pouring out of a straw-coloured fluid into blebs of various sizes, from a pea to half a walnut, which burst and leave a slightly ulcerated surface beneath. If the inflammation does not run very high, but the swelling is great from the effusion of serum into the cellular membrane, it is called œdematous erysipelas. If the inflammation does run high and extends also to the cellular membrane, then it is denominated phlegmonous erysipelas; while, to those cases which end in mortification, the term gangrenous is applied. In phlegmonous erysipelas, abscesses generally form under the skin, and in the limbs under the fascia, which, by its inelastic nature, confines their contents and causes great mischief, if not relieved by the knife. It is, therefore, of great consequence in all cases that erysipelas should be detected at once, as there is scarcely any disease more under control, and few which produce such irreparable mischief if neglected or mismanaged. With regard to its contagious nature, there is a great difference of opinion; but my own belief is, that under certain circumstances it is so, that is to say, where the contagion is very rife, such as accompanies a virulent attack of disease.

174. Traumatic Erysipelas agrees exactly in its appearance with the above symptoms, but begins in the immediate neighbourhood of some injury, and not on apparently sound skin. Thus, after an operation or a severe wound, especially if much contused, the peculiar appearance above described will show itself, and thence spreads more or less rapidly to the surrounding parts. It is quite as dangerous, and also quite as much under control as the idiopathic form. A peculiar eruption, partaking of the nature of erythema and erysipelas, occurs frequently after wounds poisoned by putrid animal matter, as in dissection, or in the trussing of game by cooks. Many cases of the latter description have come under my notice, in which a week after a prick from a broken partridge, or hare-bone, there has come on a most tormenting and slow inflammation of the skin of the hand, creeping up one finger and down another, until the whole surface has been attacked in turn, and then gradually ceasing, but occupying a month in its course. The pain and irritation are so severe as to cause a succession of restless nights; and, though the fever is not high, yet there is some present. There is a decidedly raised edge, but not any œdema; and it is difficult to assign either one name or the other to the disease, which, however, I think partakes more of the nature of erysipelas than erythema.

175. The Essence of Erysipelas is a congestion, produced by some poison in the blood; and this congestion is in some cases followed by inflammation, with its attendant secretion of serum, or pus, or gangrene. Where

the disease is soon reduced, it does not go beyond the stage of congestion, but in violent cases inflammation of the most unhealthy kind is established, requiring peculiar treatment for its management and cure. The only disease with which erysipelas can easily be confounded, is erythema, the points of difference from which I have already described. It is *possible* to mistake roseola for it, but a very slight examination will show the variation (see next par.)

176. Roseola (*rose-rash*) is an efflorescence of a rose colour without any prominence, usually accompanied by slight feverishness. The eruption appears indiscriminately on various parts of the body, and lasts from forty-eight hours to a week, when it "goes in," and leaves no visible desquamation. It is often mistaken for measles and scarlatina; and, inasmuch as it is generally accompanied by more or less disturbance of the mucous membrane of the mouth and throat, it is by no means easy at all times to distinguish between it and them. The chief points of difference from measles consist in the absence of the catarrhal symptoms, which are so prominent in the latter, and the rose colour, as well as the larger patches of the eruption in the disease we are now considering, and which are so different from the bluish-red colour and semi-lunar raised patches of papulæ in measles. Again, the absence of severe throat symptoms, of pungent heat, and of scarlet eruption distinguish it from scarlet fever, in which the above are all, or some of them, well marked. The rose-rash is very common in summer and autumn among young people of a delicate complexion and sanguineous temperament. It is also often seen on the young infant, arising apparently from the irritation of dentition, or from some intestinal disorder. Hence, it commonly receives the popular name of "red-gum," in common with infantile erythema, with which also it is closely allied; but the patches are smaller, and there is more constitutional disturbance. Still I believe that if six experienced medical men were asked their opinion about a case of red-gum, half would call it erythema, and half roseola, so nearly do they resemble each other at this age.

177. Urticaria (*nettle-rash*) puts on a very different appearance from those diseases already alluded to in this section. Its close resemblance to the wheals produced by the stings of the nettle-plant will easily enable the most inexperienced observer to distinguish it from all others. It consists of patches of eruption slightly elevated above the healthy skin, and of a pale red colour. The centre of each of these is white, and resembles a flat vesicle at first sight; but on examination it is seen to be without lymph in it, and to be of the nature of a "wheal" when produced either by the blow of a whip or the sting of a nettle. There is intense itching and tingling, exactly like that produced by nettles, and the desire to scratch the skin is almost irresistible. The eruption comes out suddenly, and often disappears again as quickly, sometimes fading and reviving several times in the course of a day. There is generally more or less fever which is of a remittent character, ceasing almost entirely in the early part of the day, and appearing in the evening when the eruption is most active. It is not contagious, but is generally dependent upon some irritating substance in the stomach, such as stale shell-fish, or on a diseased condition of the blood. It is commonly divided into two kinds—1st, transient nettle-rash, caused by some irritating agent, such as the nettle, or decayed shell-fish, or sometimes mushrooms, or again turpentine or balsam of copaiba, all of which are unaccompanied by fever; 2nd, febrile nettle-rash, in which the poison has been developed in the blood, and continues to produce its effects day after day, with more or less fever attending on it. It is most probably due to some error in diet, or to want of exercise proportionate to the nutrition going on.

Sect. 3.—Vesicular Diseases.

178. The general definition of the vesicles which accompany these diseases is as follows:—Small elevations of the cuticle containing lymph, which

is visible through it. The lymph may be transparent or opaque, colourless or straw-coloured, or pearly, and the small size of the vesicles distinguishes them from *bullæ* or *blebs.* The lymph in these small vesicles or blisters is either re-absorbed, or the cuticle bursts, when the cutis is exposed in an excoriated state, or it is covered with a scurf, or protected by a crust of dry lymph. The varieties are *herpes*, *eczema*, and *scabies.*

179. HERPES (*tetter*) is the most common of these eruptions; and of this form, the ordinary "breaking out" about the mouth of young people may be taken as the most simple variety. Here we have first a slight swelling; attended with a smarting itching, then small vesicles appear, which run together and form an irregular blister, under which is a straw-coloured lymph of an acrid character, which inflames any part of the adjacent skin that receives it. After a day or two the cuticle bursts, and the cutis shows an abraded surface if it is removed; but if allowed to remain, the lymph soon hardens into a brown scab, which protects the skin until a new and healthy cuticle is formed. This is called *herpes labialis.* It is a very common attendant upon ephemeral fever, catarrhs, and acute disorders of the stomach in children, when caused by excesses in food. When this same eruption occurs in other parts of the body, it obtains distinctive names, though there is no real difference in the cause or in the nature of the disease. Thus, when occurring on the body with a considerable number of vesicles, and generally accompanied by more or less feverishness, it is called *herpes zoster* (shingles). In this form the patches are often large enough to encircle the body, or nearly so, and then the constitutional disturbance is very considerable, though not so much so as to verify the opinion which is commonly expressed, that when the shingles meet round the body they are always fatal. *Herpes circinnatus* is another variety common enough on the exposed parts of the skin of children, in which the vesicles are very minute, and arranged in the form of a circle, with a red border and a centre of sound skin. This form is commonly called a "ring-worm," and supposed to be contagious; but it is not so, and is very readily cured, or indeed it will generally get well of itself *Herpes circinnatus* and *herpes capitis*, when they occur in badly fed children, are often developed to a great extent, so as to assume the appearance of being purulent in their nature, and indeed to secrete pus almost from the first. In that case they are often considered to be a form of porrigo, receiving the name of *porrigo scutulata*, but still in this country called *ring-worm.* From this cause great confusion has arisen, some surgeons giving the name porrigo to an eruption which another has called herpes, by which confidence is destroyed, and very often blame attached when it is not due. It should therefore be understood by the anxious parent, that an eruption of this circular nature, having a centre clear of inflammation, and vesicles or delicate pustules on an inflamed ring of a red colour, may be called by some herpes circinnatus if on the face, or herpes capitis on the head, or in case pustules are present perhaps receiving the name of *porrigo scutulata.* With the above exceptions the various forms of herpes can scarcely be confounded with any other disease after the development of their early stage, when shingles or perhaps herpes labialis may possibly be mistaken for incipient erysipelas, but the early appearance of the peculiar small vesicles soon clears up the doubt. Children are particularly liable to herpes about the mouth, cheeks, and more especially the ears, in which last situation the vesicles are very large and well developed from the firm texture of the cuticle covering that part. The burning sensation is very troublesome, and in this situation the inflammation runs very high before the vesicles appear, so as often to lead to the belief that erysipelas is going to make its appearance. The chief difference at this stage lies in the high temperature of the part in the case of herpes, giving the sensation of burning to the hand of the examiner, while erysipelas is never much hotter than the surrounding parts in this early stage.

180. ECZEMA (*running scall*) is characterized by the eruption of innumerable small transparent vesicles, set so closely together as to leave no space between them, and with an inflamed skin beneath them, which varies in colour from a bluish-red to a pale reddish-brown. The inflammation often runs high, and there is also in severe cases some attendant fever, but not to the extent which might be supposed from the large surface occupied by the eruption, which often spreads over nearly the whole of the body. On the second or third day after their appearance, the vesicles become opaque, and then either dry up with a fine scurfy desquamation, or after bursting become converted into thin yellow crusts, beneath which an acrid, watery exudation goes on, oozing out at the edge, and spreading the inflammation to the surrounding healthy skin. Here, also, we have an acute and a chronic form, and every variety in the degree and extent of inflammation, from the simple and mild eczema to the aggravated disease known as *eczema rubrum*. It will therefore suffice to describe an example of each.

181. IN SIMPLE ECZEMA there is first a very slight attack of feverishness, with the usual attendant headache, &c.; then comes on a sensation of heat and tingling over a tolerably large surface of the upper part of the body, generally the face or neck. Soon after this, numerous minute shining vesicles appear, not exceeding in size the head of a small pin; they are thickly grouped together, and the skin is not redder than usual, or very slightly so, but with the aid of a glass a very faint circle of red may be seen around each. In a couple of days they have enlarged very considerably and many of them will have coalesced, while the contained fluid has become white and opaque. By the fourth or fifth day the contained matter is dry, and in parts the cuticle has generally burst, allowing the escape of the lymph which scabs in a rough form, and assumes a brownish appearance, like the rough crust of a lightly-baked loaf. Hence the disease in this form has been called *crusta lactea*, when it appears on the cheek. In mild cases, after a week or ten days the scabs and desquamated cuticle have fallen off, and the skin is healthy beneath; but on the average, even in such simple attacks, it will take double or treble that time.

182. In the aggravated form of eczema, especially if it attacks the body and limbs, the inflammation and fever run much higher, but the latter is not a prominent feature after the first onset. The vesicles make their appearance as before, but instead of the skin being pale beneath, it is of a bright red colour, swollen, and tense, and often more like tough shoe leather in its want of pliancy, than healthy skin. The vesicles after a few days all burst, and discharge profusely a watery fluid, which is very irritating, and, if exposed to the air, scabs so as to form a thick brown crust. When the disease attacks the legs, and they are allowed to remain depending, or when the patient walks about as usual, the discharge is often enormous, and this is especially the case in the chronic form of the disease. If the air is excluded, and the scab is thus prevented from forming, the cutis, deprived of its cuticle, looks quite raw, and exhibits a general surface of red granulations; or, in old standing cases, there is very often a secretion of cheesy matter, which is a depraved substitute for the healthy cuticle. If the parts are exposed, the surface presents a curious mixture of patches of tolerably sound skin; others, bright and shiny, but showing an inflamed cutis through the cuticle; while, in other portions, the coating is in some stage of scabbing, and is separated from the more healthy portions by most painful cracks and fissures. This disease will go on for months, or even years, and when it results in a purulent discharge, instead of the watery one already described, it receives the name of *eczema impetiginodes*—that is to say, resembling impetigo, or pustular eruption. This name is only given in order to mark the presence of *pus* in a disease called *vesicular*, but as we find, that in most watery eruptions there is a tendency to this change in severe cases, it is

merely making a complicated subject unnecessarily difficult. When eczema attacks the head, as is often the case, it soon loses its vesicular character, and here it may easily be confounded with other diseases, and especially with impetigo. In it the vesicles are very minute, and generally begin at the edge of the hair behind the ears, spreading from that part over the sides and top of the head in patches, but the whole scalp being generally more or less red. After a time the vesicles burst, and glue the hair to the scalp in a very firm manner, but without that appearance of destructive pustules which is seen in impetigo. In slight cases, the patches are scarcely elevated at all, and the finger will hardly detect them; but in more severe ones, the scalp is either raw and excoriated, or else the thin whitish pus secreted is dried into light brown scabs, with fissures or cracks between them, through which the inflamed skin is clearly visible. The hair in eczema is not affected, and though in very bad cases it falls off; yet it invariably grows again with its former strength, though sometimes altered in colour.

183. Eczema occurs at all ages from the new-born baby, when it shows itself, sometimes on the skin of the abdomen close to the navel, to the period of second childhood. The essence of it appears to reside in the blood, which most probably is, in such cases, abounding in fibrine, and inclined to give it out on the slightest provocation. But sometimes local causes produce it unconnected with the blood, such as the heat of the sun on the face or shoulders, which will produce the slight form known as eczema *solare;* or, again, the irritation of soda in washing will cause a variety of eczema on the arms and hands, known as the *washerwoman's itch.* The irritation of raw sugar will, in like manner, cover the grocer's hands with a watery eruption of the same character as constitutional eczema, and which is called *grocer's itch.* Old people are very apt to produce it in their legs by sitting constantly over the fire; and, lastly, an acute form of eczema is the result of mercury taken continually, or of mercurial application to the skin, such as plasters or washes, and it is then called eczema *mercuriale.*

184. THE DIAGNOSIS between this disease and several others is difficult, and particularly so to the uninitiated. When, in the simple form, it shows itself on the hands, it can scarcely be distinguished from true itch, especially as it gives rise to considerable irritation, which is relieved by scratching. Many such cases are, no doubt, ascribed to that disease, although free from the parasitic insect which is the peculiar attendant upon the veritable disease; and, as mild eczema soon gets well under any treatment, when sulphur is applied, it perhaps gets more credit than it deserves. There is the same difficulty in diseases of the scalp; but this will be better explained in considering those which are liable to be confounded with it. It is likewise liable to be confounded with psoriasis; but the fact is, that the two diseases often co-exist, and the eruption is watery at the bends of the arms, and scaly on the plain surfaces, showing the folly of the attempts to class these diseases under divisions of so purely artificial a nature.

185. SCABIES (*Itch*) — sometimes called PSORA—is placed here, in conformity with the older writers, as a vesicular eruption, though it is only so in its early stage, and when in its mildest form. It is always unaccompanied by constitutional disturbance; but the local itching being very severe, sleep is sometimes so completely prevented, that the health suffers in consequence. The eruption almost always first makes its appearance at the bends of the joints, where the skin is the most thin and delicate, and consequently allows the *acarus*, or little parasite, to burrow with most ease. The clefts of the fingers, the insides of the wrists, and the bends of the elbow and knee, are the most common seats in the early stage; but afterwards the vesicles are seen on the insides of the arms and legs, and the skin of the body, quite as freely as in the joints. In about twelve hours, or sometimes

twenty-four, after the tingling is first felt, on careful examination one or more very small pointed vesicles may be discovered, which rapidly enlarge, until they attain the size of a corking-pin's head, if not broken, which they generally are by scratching. Most of these vesicles, which soon become numerous, are opaque, and contain a semi-purulent matter; and many bursting, or being broken, form brownish scabs, while others end in scales at the top of papulæ, the fluid having been absorbed. Thus, on examining some cases, it will appear that the disease is partly vesicular, partly pustular, partly scaly, and in part, again, papular; and, for this reason, nosologists have disputed greatly as to its proper position in their classification. If the vesicles are examined with a good glass, *in true itch*, a narrow and slightly curved line or crack will be detected leading to some of them, and terminating in a small rounded point, where the parasite lies, and whence it may with care be extracted with a needle. It is a species of acarus, or mite, and has received the name of *acarus scabiei*, or, according to another classification, *sarcoptes hominis.* Mr. Wilson has described this little animal with great minuteness; but, as early as the seventeenth century, it was almost equally well known, and its habitat investigated with great accuracy. *Scabies* occurs at all ages, and in every climate, as well as in all conditions of life; but it is of much more common occurrence among the neglected poor than in the middle and upper classes, where it only makes its appearance occasionally from being accidentally propagated by contagion from the lowest class. It is contagious without the slightest doubt; but I am inclined to believe that its spread is not so easy as is generally supposed, and that contact with an itchy hand is often made without any bad result. If this were not the case, medical men would contract the disease very frequently, as they are seldom informed of the suspected nature of the disease until they have handled the skin freely. Frequently a child of respectable parents is brought to a surgeon, and he is allowed even to take it on his knee with a view to investigate its condition, when, after looking at the tongue, and making sundry inquiries, he is astonished by some such remark as—"Oh! doctor, I wish you would just look at her skin; I am afraid there is something the matter;" when, on inspecting the hands, which have been out of sight under a cape, or some such covering, he is horrified by detecting a virulent crop of the itch vesicles, and fancies that he is covered with their parasitic inhabitants. It is true, that he washes his hands with a little extra care; but he must have rubbed his clothes against hers in sundry places, and if the eruption was so very contagious, he would, in all probability, carry off some of the offending matter, which would afterwards bear its disagreeable fruits; but, on the contrary, such an event is rarely heard of, and the fact of a medical man contracting the itch is beyond my experience. It was formerly believed that the acarus might be self-generated in certain extreme cases of dirt and debility; but this doctrine is now out of date, and the only question now is, whether the insect itself must be conveyed from one individual to another, or whether the matter will serve by containing the ova in it. When itch is known to exist, every precaution should be taken to prevent its spread, by scalding or baking all the articles which can have been contaminated, and even by burning the body linen, which is the most prudent plan to pursue with regard to that article,

186. THE DIAGNOSIS OF SCABIES is often very difficult, and not the less so, that very frequently the eruption is partly true itch, and partly some other co-incident with it, or provoked by its irritating influence. The resemblance between it and the milder forms of eczema has already been described; but the itch may generally be known by its gradual progress from two or three vesicles, more than which are seldom seen for a few days; by the conical shape of the vesicles; by the urgent itching, and by the absence of patches,

almost all the vesicles being perfectly isolated. It is, however, only the detection of the acarus which can positively settle the question; and short of this even the most experienced observer is at times liable to make the mistake. Other eruptions, such as lichen and prurigo, are also likely to be confounded with it; but these, we shall hereafter see, do not resemble it nearly so much as eczema.

SECT. 4.—BLEBS.

187. BLEBS are large vesicles, and they are included under vesicular eruptions by many writers; but as their appearance is so wholly unlike that of herpetic eruptions, they are here kept distinct. The ordinary bleb may be compared exactly to a small blister from a burn or scald. There are three varieties of this eruption—*pemphigus pompholyx*, and *rupia*, all of which are somewhat rare, and beyond the probable reach of the domestic observer.

188. PEMPHIGUS occurs chiefly in young children and infants in crowded localities, and when ill-fed and debilitated by various causes. It is generally seen on the arms and upper parts of the body in small blisters, varying from the size of a pea to that of a horse-bean. These appear without much fever, last about a week, and then die away, being often succeeded at uncertain intervals by a similar crop.

189. POMPHOLYX is the name given to an eruption of a similar character, which attacks children of riper years and sometimes delicate adults. The blebs are larger but less numerous, and the likeness to scalds is still more marked.

190. RUPIA is an eruption which is commonly called vesicular; but according to my judgment, and that of some other observers, it should rather be considered a pustular disease. It certainly appears at first in the form of blebs containing lymph; but this soon becomes pus, and an unhealthy ulcer is the result, the secretion from which dries if exposed to the air; and as the ulcer keeps extending, the successive layers are thrown up in the exact form of a limpet-shell, each consecutive layer being larger than the one before. The scabs finally rise so high that they are inevitably rubbed off, and then the ulcer is exposed, and looks raw and inflamed; but it speedily forms a fresh crust, and a second limpet-shell is in time produced, but not nearly so perfect in its resemblance to its prototype as before. There are not often many of these on the same individual, and generally they are on the extremities. The limpet-shaped crust easily distinguishes this eruption from all others.

SECT. 5.—PUSTULAR ERUPTIONS.

191. PUSTULES are circumscribed elevations of the cuticle containing pus, and ending in scabs or crusts. There are four kinds of pustules described by writers on skin diseases; but their difference depending only upon the shape of the pustule, and the degree of consolidation or hardness of the base. I shall merely give the names of the four, which are — 1st, the *phlysacious*, 2nd, *psydracious*, 3rd, the *achorous*, and 4th, the *favous* pustule—names which are sufficiently jaw-breaking to frighten beginners from the task of investigating their meaning.

192. The pustular eruptions which are now to come under examination here are—1st, *acne*; 2nd, *porrigo*; 3rd, *impetigo*; 4th, *ecthyma*; and, 5th, *boil* and *carbuncle*, which last, though generally said to be the result of the sloughing of the cellular membrane, are really *at first* merely arising from slough of the true skin.

193. ACNE is a chronic eruption whose seat is in the sebaceous follicles, which either from some cause secrete such a thick and cheesy matter, that it will not pass out of them, or else their mouths become thickened and contracted, and in that way confine the secretion. The eruption has received a variety of names, all depending upon the exact appearance given to the eye of the observer, and having no reference to any other cause or effect. Thus it is called acne *simplex*, when there is merely a slight inflammation of the follicle, causing a pimple, on the point of which a little pustule forms, and after discharging its contents the cause

of the disease is for a time removed by solution in the pus, and the inflammation subsides. If the follicle has been long inflamed, and the cheesy matter has been allowed to get stained black by dirt, it receives the name of acne *punctata*. When several adjacent follicles inflame together, and their bases become hard it is *acne indurata;* and if more red than usual, and especially on the nose and cheeks, the term *rosacea* is applied to it. But most of these eruptions are easily recognised by the presence of inflamed follicles, containing cheesy matter in every stage of softening, and capped by pustules varying in size from a small, to a very large, pin's head. Sometimes, however, little or no matter is formed, and then there is nothing to be seen but a set of hard, inflamed, and painful little swellings, about the size of a split-pea, and which can only be recognised as acne from the point corresponding with the mouth of a follicle. The acne rosacea has also received the name of "carbuncled-face," "brandy-face," "copper-nose," and "rose-drop." The causes of acne are not well ascertained; but there is no doubt that the acne simplex may co-exist for a long time with an average amount of general health. It is a disease which so often accompanies the age of puberty, and is so seldom seen after that period, that it is considered peculiar to it. It is generally supposed to depend upon the development of the skin, which is said to take place at that period; but at all events, it may be granted that it does coincide in point of time with extra growth, which goes on at this age in the hair; that being an appendage of the skin. The indurated and rosaceous forms seem to be of a congestive character, and generally mark the presence of congestion elsewhere—either in the stomach, bowels, or uterus. With regard to cure, acne simplex is tolerably easy; but acne rosacea and indurata are very often exceedingly obstinate. They can scarcely be confounded with any other eruption from the presence of the obstructed follicles, and the pointed nature of the inflamed elevations, or pimples.

194. SYCOSIS AND PORRIGO are often classed together, because they are supposed to be similar in their peculiar causes, and in their both attacking hairy parts only, such as the head in both sexes and the chin of the male. Both are said to be either caused, or at all events accompanied, by a vegetable fungus or cryptogamous plant, which is developed, no doubt, in many cases of sycosis, and in most, if not all, of those known as porrigo. However, it will be better to examine each separately.

195. SYCOSIS, *or Chin Welk*, is an eruption very similar in appearance to an aggravated attack of *acne indurata*, but occurring always on the chin, whiskers, or other parts of the face occupied by hair. It is a chronic inflammation of the skin, and its subcutaneous cellular tissue, including the hair ducts or tubes, in which the hair is ensheathed. There is no absolute necessity for the presence of enlarged and inflamed follicles; but some of these generally accompany the disease. It begins in the form of an eruption of small, pointed, and painful pustules, which are seen to surround a hair. These soon dry and scab, forming a greyish scurf—the size, colour, and thickness of which varies greatly, according to the period and extent of the eruption. The scab is generally irritated or removed by the razor; but, if not, it falls off in the course of a fortnight or three weeks, leaving a hard, indolent, red, and shining tubercle behind, which, in time, gradually sinks to the level of the adjacent skin. Others arise on some other part, and so a succession keeps the sufferer always in fear of his morning's shave. By some people, the term is applied to indurated acne attacking the chin, but by others it is restricted to an eruption such as I have described, in which there is always developed a vegetable fungus, and which is then said to be contagious. But this is so rare a disease as scarcely to deserve notice here.

196. PORRIGO, or *scall'd head*, is one of the most troublesome eruptions with which mothers of families in this country are teased. By many it is not

considered a pustular disease; but I have so placed it, because the beginner would naturally expect to find it among that class, seeing plenty of pustules before his eyes, or, at all events, little collections of pus which he takes to be such. Others, also, consider as a species of porrigo a very severe form of ringworm (*herpes capitis*) which has been described under that head; so that by them porrigo is said to consist of two, or by some writers of three varieties—porrigo *scutulata* (otherwise herpes capitis or ringworm); porrigo *favosa*, or true *scall'd head;* and porrigo *decalvans*, which certainly is not a pustular eruption, and will be described under the section treating of the diseases of the appendages of the skin. It, therefore, only remains for us to examine the remaining porrigo *favosa* (sometimes called favus or tinea, and always rendered into English as scall'd head). It begins in the form of little raised dry spots on the skin, like pins'-heads of a bright yellow colour. Each of these is indented on the surface and also lodged in the skin itself, so that when it is removed, the scalp has a smooth and shining cup left in it. These crusts, with the cup containing them, enlarge in size, and are perforated by one, two, or three hairs, according to their diameter; and as these crusts, (each of which is called *favus*, from its resemblance to a cell of a honeycomb) increase in size they coalesce and form large irregular masses, by which the surface of the scalp is hidden, but always having at the edges a series of smaller crusts in the earlier stage of growth. The crusts are of a pale yellow, more or less stained with dirt according to circumstances; they are hard and dry, and may be easily removed from the scalp, except when adhering to the hair, which is always inclined to fall off from the first, and therefore comes away with the crust without much difficulty. Unlike the forms of herpes and eczema, when this disease has lasted for any length of time, the hair is permanently injured in colour and texture, and never regains its previous healthy and strong appearance. The eruption generally begins near the forehead, but soon spreads over the head, leaving a few healthy patches here and there. Fresh pustules continually form at a short distance from the existing disease, and on the centre of a new outbreak, so that very soon the tingling and heat occasioned by the inflamed surface are more than the poor little patient can endure, without scratching the surface so as to produce ulceration, accompanied with a peculiarly disagreeable smell, and a copious discharge of yellow matter. If at any stage the crusts are examined with the aid of the microscope, they present, according to the French observer, M. Robin, the following appearances: — "1, tortuous branching tubes without partitions, empty, or containing a few molecular granules (*mycelium*); 2, straight or crooked, but not tortuous tubes, sometimes, but rarely branched, containing granules or small rounded cellules, placed end to end, so as to represent partitioned tubes, with or without jointed articulations (*receptacles*, or *sporangia in various states of development?*) 3, finally, sporules, free or united into bead-like strings. The mycelium is very abundant near the inner surface of the external layers to which it adheres. The spongy friable mass of the centre of each favus is principally formed of sporules, and the different tubes containing mycelium already described (*sporangia* or *receptacles*)." The same gentleman also gives excellent illustrative drawings of this fungus, or vegetable parasite; and it is now generally admitted that it exists in every case, a point of the greatest importance in the successful treatment of the eruption. It may appear at any age, but is seldom seen except in childhood. It is also sometimes seen on the naked skin, but generally attacks the hairy scalp. It is now comparatively a rare disease in this country, though common enough forty or fifty years ago, and still frequently seen abroad. It is certainly contagious, most probably by the vegetable growth being propagated in the form peculiar to itself, but as this requires a soil suited to its nature, it will not take root in any but a head in which there is a scurfy or dirty surface-soil, and, in addition, a state of the blood suited to its development. In this respect it closely imitates other fungi, which only grow on their own *habitats.* Hence, there must be co-operating, dirt or scurf, a cachectic habit of body, and the seeds of the fungus, in order to produce the disease; and as, fortunately for this country, the three do not often fall together, scall'd head is every year becoming more and more rare. The *diagnosis* of this disease is tolerably easy, as the dry yellow crusts are unlike anything else in the shape of eruption. When scratched and converted into an open ulcer, it may be mistaken for impetigo; but by attending to the description of that disease to be presently given, it will readily be distinguished from it.

197. IMPETIGO (*crusted tetter*) is the name given to an eruption of pustules, occurring either singly or in groups, with but little surrounding inflammation. They come on rapidly, and discharge a thick purulent matter, which dries into a greenish-yellow rough crust, from beneath which purulent matter continues to be secreted, and to add to their extent and thickness. Fresh pustules keep showing themselves on the adjacent skin, and so the disease spreads until a large surface of the body is covered; and after a time, a thick crust is formed, separated into broken portions by fissures, which allow the matter to ooze through, but the skin underneath not being so red and inflamed as in eczema. The disease is named *impetigo figurata*, when it appears in patches of an oval or circular shape, and thence spreading, implicates a more or less extensive surface, being attended with considerable fever, and its usual concomitants; *sparsa*, when the pustules are scattered by themselves over the surface, being generally thick on the legs and lower part of the body. In this eruption there is also fever, but less acute than in the first form. *Impetigo capitis* is the third variety, and is the only true pustular disease which attacks the scalp; so that, if the observer will carefully examine such an eruption in its early stage, before the fingers of the child have altered its character, and finds that well-developed pustules are present—not dry crusts, as in porrigo—he or she may come to the conclusion that the disease is impetigo, and not contagious, which is a most comfortable reflection in a school or large family of children. In children, it is preceded for some days by feverishness, after which the scalp becomes hot and painful, with a general blush of inflammation; soon after the appearance of which, the eruption shows itself in the form of small pustules, scattered separately over the head, or in groups thickly set on an inflamed base. In the former case they are of the size of small split-peas, while in the latter the size depends upon the number. About 20 or 30 hours after their appearance, each pustule contains thick yellow matter, and bursts, forming a scab of a greenish-yellow colour; and in a few days this part of the skin is sound again, other eruptions being kept up by a fresh crop of pustules. The hair is often matted into a mass, and destroyed in texture in consequence for the time; but it always grows again as before, and there is never any permanent disfigurement. The disease is evidently dependent upon constitutional causes, the blood being in all probability overloaded with unhealthy matter. When this is the case, and in addition the skin is irritated by dirt, and the health further impaired by unwholesome diet and bad air, the disease is likely to occur. It can easily be confounded with eczema and herpes in their later stages, when they are crusted, but in the early stage the vesicle is so readily known from the pustule, that the two can hardly be mistaken. From porrigo it may also be distinguished by the matter appearing in the early stage in a distinctly liquid form; whereas, in porrigo, it is not then at all events purulent, but dry and powdery.

198. ECTHYMA (*pimply scale*) con-

sists in the eruption commonly known as "pimples," though dignified by the name of ecthyma, and appearing in the shape of small pustules, on a hardened and more or less inflamed base. They are usually alone, but sometimes in patches, and of every size, from a pin's-head to that of a small boil. After a time the pustule bursts and scabs, a small ulcer being exposed, which heals in a few days, and the reddish colour left for a time ultimately disappears. Sometimes the pimples are of larger size than common, and the scales attain the size of a sixpence, or even of a shilling, and the eruption is then attended with considerable constitutional disturbance. The *cause* of these pimples seems most probably to reside in our stimulating diet and defective habits of cleanliness, or sometimes in debility of the system. It can be only confounded with acne or impetigo, from which it is not easy to distinguish it, except by long practice, as is indeed the case with most of these cutaneous diseases.

199. BOILS are not usually considered as diseases of the skin, though undoubtedly, in my opinion, they are originally, and in many cases throughout their course. Almost all boils begin with a pustule on the top of a small conical swelling, which is hard, and exceedingly painful. In this pustule is a drop of matter; and if in this early stage the base is thoroughly divided, nothing further takes place, and the inflammation subsides, leaving, as the result of the division, a common ulcer, to heal in the ordinary way. This, therefore, shows that the original disease is confined to the skin, and that the subsequent slough is the result of the high congestion and pressure exercised upon the deeper textures. In the regular course of things, after the pustule has burst, the swelling goes on increasing in size and in pain; and, at the end of a fortnight, it will often attain the size of half a walnut, containing within and beneath its walls a slough or "core," which takes a long time to come away, even with all the aid which good surgery will afford. The pain is occasioned by the pressure of the hardened ring upon its own nerves; for the moment this pressure is taken off by a division right through it, relief is afforded. When two or three of these boils happen together, or when the inflammation of one extends to the surrounding skin, and is thence propagated to the subcutaneous cellular tissue in the same way, a number of these sloughs are produced with a large and dense ring of inflamed skin, binding them down still more firmly, and aggravating the pain and constitutional disturbance tenfold. This is a *carbuncle*, which is sometimes attended with great danger, from its enormous size, and the demands upon a broken-down constitution which it exerts, in order to throw off the sloughs and repair the breach made. Both boils and carbuncles are evidence of an excess of fibrine, or inflammatory matter in the blood, producing a sluggish circulation in the first place, and then a secretion of this fibrine into the substance of the skin, by which it is rendered hard and tense, and thereby aggravates the original disease, till a slough or sloughs are the result. No one can mistake a boil for anything but a large pimple, the one rising into the other insensibly; and a large pimple, a blind boil, a boil, and a carbuncle, being often successive stages of the same disease.

SECT. 6.—PAPULAR ERUPTIONS.

200. The presence of a papula, or pimple, is the sign by which these eruptions are known. The definition being a small-pointed elevation, without vesicle or pustule, and only ending in a scurfy lamina of the cuticle. There are only two forms, both of which are common enough, viz., *lichen* and *prurigo*.

201. LICHEN is a crop of these papulæ, of a red colour, and of this a well-known example is seen in the common *red-gum* of infants, which is the lichen strophulus of writers on skin diseases, otherwise called *tooth-rash*, or *white-gum*. It attacks infants at the breast, or at any age under five or six months, and is not attended with any dangerous con-

sequence in itself. Besides this, there are several varieties of lichen known in this country, but all resembling in character that easily recognised eruption; such are lichen simplex, and lichen agrius, as well as lichen urticatus—the last so named from its resemblance to nettle-rash; but all of them being such rare diseases as to be of little interest to my readers.

202. PRURIGO, OTHERWISE PRURITUS, is a disease of the nature of which we know little or nothing; and, therefore, it is often said to be of a nervous character. Sometimes there is a set of pimples very slightly elevated above the level of the skin, but *not at all altered in colour*, and therefore only detected by the finger, when attention is drawn to the part by the sufferer, who complains of the intolerable itching, which no scratching will allay. It may serve for our present purpose to remark, that when there is this distressing sensation present for any length of time, and no visible eruption, it may be set down as a form of prurigo, and treated accordingly. In the young person, and in the adult, it is seldom seen, except on the skin around the outlets of the bowels, bladder, &c.; and here the irritation is often extreme. In the very old, a peculiar form of prurigo is very common, called *prurigo senilis*, which is perfectly unmanageable by any treatment, and often extends over the whole body, lasting even for years, with very short intervals occasionally.

SECT. 7.—SCALY ERUPTIONS.

203. SCALES are thin, indurated, whitish or yellowish, opaque layers of the cuticle covering inflamed surfaces, and they are continually being shed and renewed.

204. THE VARIETIES are *lepra*, *psoriasis*, *pityriasis*, and *icthyosis*.

205. LEPRA AND PSORIASIS are so essentially varieties of the same disease, that it is no wonder that they are now often classed together as such. Both are eruptions, in which large scales, of the size of a sixpence on the average, appear on various parts of the body, sometimes in small distinct round patches of a red colour (*psoriasis guttata*), at others in patches of a more irregular shape and size (*psoriasis diffusa*). These are attended with some slight irritation; but in lepra (sometimes called *psoriasis lepriformis*), there is none at all, and from the sensations alone the patient would scarcely discover the presence of the eruption, except from the rough feeling to the hands afforded by the scales. In true lepra, the scales are very white and shining; and they generally first appear on or near the elbows and knees, never showing themselves on the face. Both are constitutional diseases, and lepra is supposed to be hereditary. They generally prevail in families, and they are liable to a return after being apparently cured. Of the causes, we know little or nothing. *Psoriasis palmaris* is a form of this disease, which occurs in the palms of the hands, apparently from a deficiency of moisture, or at all events accompanied by it. It often extends to the nails, rendering them so brittle as to break on the slightest touch.

206. PITYRIASIS OR DANDRIFF presents a much smaller scale than psoriasis or lepra, together with a natural colour of the skin beneath. The form of dandriff, which occurs on the heads of children as well as on those of grown people in some cases, is well known to us all, and affords a good example of the milder stages of the disease. Very irritable skins which are subjected to severe friction are liable to pityriasis, and the tooth-comb as well as the hard-brush in the hands of careless nurses often lay the foundation of dandriff, which lasts for years. But, besides this kind of pityriasis, there is another, dependent upon constitutional taint, and which is often perfectly unmanageable.

207. ICTHYOSIS is a peculiar and rare form of eruption, in which the cuticle assumes the appearance of dry fish-skin, or more correctly perhaps that of the lizard's skin. It is too rare to require further notice here.

SECT. 8.—TUBERCULAR ERUPTIONS.

208. The distinguishing name given

to these eruptions must not be confounded with that assigned to the little bodies met with in the lungs of consumptive persons, having nothing to do with that disease. The skin-tubercle is a small, hard, and solid circumscribed swelling of the cutis, with or without an inflamed base, and of a chronic character, and ending either in resolution, suppuration, or ulceration. The only variety which will be at all interesting to my readers is that known as lupus, or noli me tangere.

209. **Lupus**, *noli me tangere*, or *corroding tetter*, appears generally on the face. It is always characterized by a thick, hard, and red swelling of the skin, without much pain, and either accompanied by a corroding ulcer at its edge *(lupus exedens)*, or by a dry brown scab, without any tendency to destructive ulceration *(lupus non exedens)*. In either case, the disease creeps on stealthily, often taking months to advance a quarter of an inch, but never quite stationary. In the corroding form, the nose is often lost either wholly or in part; and this is generally the disease which causes those frightful disfigurements which we see among the lower classes, compelling them to wear a bandage over the face. Further than this, it is unnecessary to allude to it, as its treatment is beyond the domain of domestic surgery, except for palliative measures.

Sect. 9.—Spots or Marks.

210. A **Spot** is a permanent discolouration of the skin, sometimes accompanied by change of structure, and not affecting the general health.

211. The varieties embrace *freckles*, *claret-marks*, *liver-spots*, *albinism*, &c., none of which require any treatment, and are therefore uninteresting to my readers; but to these must be added the *mother's mark* (nœvus), which is sometimes attended with an alteration of structure, and requires surgical interference. Here, however, there is a disease of the blood-vessels, which will be examined under that head. (See *Aneurism*.)

Sect. 10.—Diseased Growths from the Skin.

212. The distinguishing mark of these diseases is supposed to be, that there is actually some growth of the skin itself, and not, as in the case of lepra or eczema, an alteration merely of the structure of the cuticle; but one of them, commonly called *a corn*, is clearly only a thickening of the cuticle, which, by pressure, causes inflammation of the true skin. Nevertheless, for convenience's sake, it is retained here, as it would scarcely be likely to be sought for elsewhere. The varieties are—*warts*, *corns*, *moles*, and *condylomata*.

213. **Warts** consist in hypertrophy of the papillæ of the skin, by which a round tumour with a flattened top is formed. They vary in size, from that of a small pin's head to the dimensions of a horse-bean; and their free surfaces are, after a time, covered with a rough coat, which is supposed by the vulgar to contain their seed, but which is really only a thickened cuticle, rendered rough by friction, to which they are exposed from their prominent position. They are very numerous on the hands of some people, and come and go without much notice, frequently having entirely disappeared before their absence is discovered. Their appearance is too well known to need further description.

214. **Corns** are composed of thickened cuticle, which, pressing upon the subjacent cutis, causes inflammation and pain; and thus, the one reacting on the other, the disease goes on increasing to an indefinite degree. Some people are so lamed from this cause, that they can scarcely hobble, and their lives are thereby rendered miserable. In consequence of the pressure on the outside, the new and thickened cuticle is often driven into the cutis, in the shape of projections or roots, which aggravate the inflammation from the sharp points they present to the inflamed surface of the cutis. Very often there is an irregularly round cup formed in the skin, which is filled by hardened cuticle, and is

exquisitely tender to the touch, so that no pressure whatever can be borne. These corns are, in rare cases, born with the child, and cannot, in such cases, be the result of direct pressure; and we can only suppose that they are handed down from parent to child in the same way as other acquired peculiarities. Beyond these congenital corns, I have never seen any others which were not the result of pressure, and I fully believe, that in all other instances corns may be traced to that cause, and no other. Nevertheless, tight shoes do not always produce them, neither do loose ones serve always as a protection against them; for if the joints are prominent, the pressure must be taken by them, whether the shoe is loose or tight, *unless it is chambered*, and in no other way can they be prevented. Their presence between the toes, when they are called *soft corns*, is always due to pressure, joined to the presence of the secretion of the part, which, when confined, leads to an undue secretion of cuticle, especially in our unnatural mode of restraining the perspiration by air-tight boots and shoes. Corns, however, are not confined to the feet, being common enough on the hands of the artizan who uses his hands severely, and are particularly common on those of the rower, whether amateur or otherwise.

215. Moles are always congenital, and are sometimes called mother's-marks. They are either mere prolongations of bare skin, covered by cuticle, or covered with a downy hair.

216. Condylomata, sometimes also called warts, are little fungoid bodies, which appear about the external apertures, in consequence of the irritation of the secretions under certain circumstances. At first they are red, but ultimately they become white, and look like little cauliflowers. They require careful surgical treatment, and should, therefore, be at once submitted to skilful hands.

Sect. 11.—Disease of the Appendages to the Skin.

217. These comprise—1st, *diseases of the hair*; 2nd, *those of the nails*.

218. Diseases of the Hair consist in alterations of its natural colour and texture, or in its total loss. Cases are recorded in which the hair has changed suddenly from black or brown to red, or from brown to black, &c., in the course of a short time, either from acute disease, such as fever, or from some cause which was not apparent. The colour, also, is said to have totally disappeared in a single night, leaving the hair white, or nearly so; and, as is well known, this change is common enough when occurring more slowly from the effect of age; and even occasionally before the middle period of life, so that some people are grey at 20 or 21 years of age.

219. Baldness, or Falling Off of the Hair, is either the result of age or disease, though in the former case it is often premature, many men, as well as women, becoming bald long before they arrive at the middle period of life. This kind of baldness, like the turning grey of the hair, is very apt to run in families, so that a bald father is more likely to have a bald son than one whose hair has remained on his head to a late period of life. But the baldness arising from disease is not at first confined to the crown and top of the head as in natural baldness, but commences at the sides, back, or top, indiscriminately. It may be the result of porrigo favosa, described already, or of some constitutional diseases, which are the result of intemperance and excess; or it may be a peculiar disease of the hair follicle, known by the old name given by Willan, of *porrigo decalvans*, or that now usually assigned to it, of *alopecia circumscripta*, meaning thereby merely circumscribed baldness. In this form the hair falls off without any eruption or apparent cause, leaving circular patches of the scalp free from all redness, or even scurf or dandriff, smooth and shining, and with the healthy hair abruptly growing in its full luxuriance from the very edge. Sometimes there are only one or two of these patches, whilst at others several occur near to or far from each other, as the case may be; and they

even sometimes coalesce, so that an irregular pathway is seen through the hair, which may, perhaps, include a large portion of the scalp. The cause of this disease is not known, but it may be conjectured that it arises from debility, since stimulating applications have the effect of bringing the hair on again, unless it is entirely destroyed—that is, when not the slightest appearance of fine hair can be discovered.

220. Diseases of the Nails are chiefly due to inflammation at the root or matrix, which causes an unhealthy secretion of the horny matter; or sometimes this goes on to such an extent as to produce an abscess, followed by an ulceration of an unhealthy character, requiring the removal of the nail for its cure; or the nail may grow in so as to press upon the skin and cause ulceration, which is mainly due to the improper mode of cutting the nails of the toes, by which they are made to turn in unnaturally. Toe-nails should always be cut straight across, and not rounded, by which precaution the corners will grow long, and will thus be prevented from doing mischief.

CHAP. XI.

CONGESTION AND INFLAMMATION OF THE CELLULAR MEMBRANE.

Sect. 1.—Structure of the Cellular Membrane.

221. The Cellular Membrane, although commonly receiving this name among surgeons, is now shown to be destitute of cells, and by the physiologists of the present day is called *areolar tissue*, being, in fact, a network of minute fibres and bands, which are interwoven in every direction, so as to leave innumerable little spaces (*areolæ*), which communicate freely together. Of these fibres, some are yellow and elastic, but the greater part are white, and frequently present the form of broad flattened bands, without any distinct fibrous arrangement. The interstices are filled during life with a fluid which resembles very diluted serum, consisting chiefly of water, but containing some albumen and common salt. This tissue is very extensible in all directions, and highly elastic, but has very little sensibility. It exists in almost every part of the body, binding together the various parts, such as the muscles, arteries, veins, and nerves, as well as the glands; and also uniting the fasciculi of the muscles together, to make up what is called "a muscle," as well as the glandules to form what we denominate compound glands. In speaking surgically of the cellular membrane, the fat cells are generally included, but they are quite distinct in themselves, and are as completely enveloped by cellular membrane, and not part of it, as are the muscles, glands, nerves, or arteries. An areolar tissue enters into the composition of the lungs, being in fact the actual "cells" as they are called, into which the air is admitted, though as unlike cells as the areolar tissue of the extremities; indeed, it is an analogous material, and similar also to it in its inflammations and other diseases. It, however, is lined by a true secreting membrane (the mucous lining), but the general areolar tissue of the body has nothing of this kind; and although its contained fluid varies in quantity, yet in health as well as in disease, this change is dependent upon other actions than secretion. Thus, in health, it appears to depend upon mere transudation from the vessels which traverse it; and hence, in proportion to their fulness or emptiness, will be the amount of fluid in the areolar meshes. It is now well

known that when a watery fluid containing albumen in solution is in contact with an animal membrane, the watery part will pass through it; but this is more fully explained under the heads of *Endosmose* and *Exosmose*. When, therefore, there is want of firmness or tone in the vessels of the part, so that they contain more fluid, an unusual proportion of the watery part of the blood will pass through, and distend the areolæ of the tissue, constituting what we call *œdema* in its milder form, or when more general and severe, *anasarca*. When either of these diseases is present, the elasticity of the parts is interfered with; and if the finger is pressed deeply into the skin, it "pits," or leaves the impression of the finger, as if in a piece of dough, for some seconds. Independently of this peculiar symptom of œdema, there is also another, consisting in the invariable tendency of the fluid to gravitate towards the lowest part, and which is caused by the free communication existing through the whole of the areolar tissue of a limb, or indeed of the whole body, though partially cut off in places by what are called *fasciæ*, being thin and condensed layers of fibrous membrane.

SECT. 2.—INFLAMMATION AND CONGESTION OF THE CELLULAR MEMBRANE.

222. CONGESTION of the blood-vessels of the areolar tissue, as has been already observed, may lead to an oozing of thin watery particles, constituting the two conditions called *œdema* and *anasarca;* the former being a symptom of slight local or general debility, while the latter affords evidence of serious organic mischief.

223. INFLAMMATION of the cellular tissue begins by interfering with its elasticity and power of expanding, making it hard and unyielding, though easily broken down. Its *areolæ* are next filled with an opaque reddish jelly, which adheres firmly to their walls, and the density of which is in proportion to the severity of the inflammation, and which forms a species of œdema called inflammatory. In intense inflammation, besides this kind of infiltration, there is also blood itself extravasated, mixed with a watery fluid stained with blood, or with broken-down fatty matter, or with globules of pus. After a time, when matter is thus formed, it is collected into one or more masses, stretching out the material of the tissue so as to form a cavity, the walls being lined by a dense layer of reddish lymph, which is organized and full of blood-vessels. The sides of this cavity gradually enlarge, the pus increases in quantity, the surrounding œdema subsides, and an abscess is said to have formed. This kind of cellular inflammation is called *phlegmonous;* it may take place in any part of the body, but there are some in which the cellular membrane is particularly liable to it, such as the neighbourhood of the jaw, rectum, &c. Phlegmonous inflammation may be acute, as in the above form, or chronic, such as will be presently described; and the pus may be healthy—that is, whitish yellow, smooth, like cream, and free from smell—or it may be unhealthy, and contain blood, or lymph, or be too watery, or offensive to the nose.

224. DIFFUSED INFLAMMATION OF THE CELLULAR MEMBRANE differs from phlegmonous in not being circumscribed by any line of demarcation, but, on the contrary, has a tendency to spread without limit. This form attends upon the worst kinds of phlegmonous erysipelas, and is generally occasioned by the inflammation of the veins of the parts, or by some external injury in a shattered constitution. It may also exist without erysipelas, where there is diffused suppuration of several portions of inflamed cellular tissue. This, however, is comparatively a rare disease.

225. IN CHRONIC INFLAMMATION of the cellular tissue, it loses its elasticity quite as much as in the acute form, and becomes condensed by the infiltration of an albuminous fluid filling its cells. It is more tough than in the acute form of the disease, and the inflammation may be circumscribed or diffused.

A peculiar kind of chronic inflammation of the cellular membrane is seen in badly-reared children, whose skins are tied to their bones (skin-bound), and the whole surface feels swollen and hard. Suppuration or ulceration sometimes follows chronic inflammation of the cellular membrane, but perfectly healthy pus is seldom found, the fluid being half pus and half serum, with a tinge of blood.

226. GANGRENE sometimes follows acute inflammation of the cellular tissue, when severe enough to destroy its vitality from the very commencement. This is generally the effect of some peculiar poison, such as that of erysipelas in its worst form, hospital gangrene, &c.

227. PERIPNEUMONY, sometimes called *pneumonia*, is an inflammation of the areolar tissue of the lungs, and is only remarkable from its intensity, and from the dangerous consequences which ensue to so important an organ. The various forms of this inflammation follow the types described above as those of the general areolar tissue; but they are attended with peculiar symptoms, which it will be necessary to describe here.

228. PNEUMONIA is ushered in by fever, with more or less pain in some part of the chest, *increased on a deep inspiration*; accelerated and sometimes difficult breathing; cough, with an expectoration of sticky, rusty-coloured mucus. On using the stethoscope, there is a peculiar sound, like the crackling of dry bladder; and, in the later stages, dulness on percussion. The face is generally flushed, and the eyes injected; thirst excessive, and tongue dry and furred. Pulse quick and full, but generally compressible. In slight cases, the disease declines on the third or fourth day, but on the average it lasts about ten. In bad cases the symptoms go on increasing in severity from their first appearance; the respiration becomes quicker and more difficult, the pain on inspiration more severe, though still of a dull character, the cough troublesome, and the expectorated matter of a still deeper colour, and of a more viscid consistence. The pulse becomes very quick and feeble, the tongue is dry, and covered with a brown fur; skin very hot, or, in the last stages, cold and clammy; at which period, also, the lips become blue or even livid, the difficulty of breathing increases to suffocation, the pulse is small and fluttering, and the "death rattle" comes on as the close to the painful scene. During this progress of the disease, the areolar tissue has gone through the change above described, constituting an appearance called *hepatization*, which may be either *red or grey*; or, matter may be formed in a cavity, called then a *vomica*, or blood may be effused, producing *pulmonary apoplexy*. But it must be obvious to any one who examines the structure of the lungs that, as pneumonia is always accompanied by an effusion of rusty mucus through the mucous membrane, so that organ must be more or less implicated. Nevertheless, it often is so only in a secondary degree; and, though the two run into one another in most cases, yet in many the mucous membrane is very slightly implicated, and the disease is comparatively a pure pneumonia. *The causes* of pneumonia are chiefly the sanguineous temperament, and the plethoric or inflammatory condition of the blood, by which an effusion of lymph somewhere is threatened, and brought on by cold. The exact and precise cause for this local affection it is difficult to assign, but it often seems to depend upon the over use of the lungs in exercise, and their subsequent exposure to cold air; or, on the other hand, the sudden change from cold air to a hot room. It is very apt to complicate typhus, small-pox, measles, erysipelas, and scarlet fever.

229. CONGESTION AND INFLAMMATION of the lungs are two conditions, which it is rather difficult to distinguish from each other without the aid of auscultation; and those who pretend to undertake the task should always call in the aid of the stethoscope. Nevertheless, one sign may afford a tolerably accurate diagnostic mark, and may generally be relied

en; for though in both there may be difficult and quick breathing with cough and slight expectoration, together with fever and quick pulse, yet in congestion the mucus is not *rusty-coloured*, and is whitish-yellow or transparent and frothy. Congestion, also, seldom lasts more than one day, or, at most, 36 hours; and either disappears entirely, or else goes on to the stage of inflammation. Active congestion may give rise to effusion of serum, but not to any form of hepatization.

230. PNEUMONIA, therefore, may be distinguished from bronchitis by the presence of the rusty-coloured expectoration, by the pain on inspiration, by the crackling sound heard in the chest on examining with the ear; and also from congestion, by the presence of the same signs.

CHAP. XII.

CONGESTION AND INFLAMMATION OF SEROUS MEMBRANE.

SECT. 1.—STRUCTURE OF THE SEROUS MEMBRANES.

231. THE SEROUS MEMBRANES are those expansions which line certain bags without openings, and serve to allow important organs to move their situations without injury to one another. Thus, wherever an organ is contained within protecting walls a serous bag is interposed, one-half of which is glued to the containing and the other to the contained, leaving the two smooth surfaces to glide upon each other freely, and to be lubricated by their peculiar serous fluid. *Synovial membranes* in the same way line the ends of the bones, which together form a joint, and are composed of the same structure as serous membranes, being, in fact, identical with them in anatomical structure and physiological use. The free surface of both is covered with cells, being called the epithelial layer; whilst beneath is the basement membrane, which is similar to the corresponding layer in the mucous and other tissues. The serous membrane is traversed by blood-vessels, nerves, and lymphatics, in different proportions; and the fluid contained is so nearly similar to the serum of the blood, that it merely requires a knowledge of the process of transudation to account for its presence. In the synovial capsules there is more albumen, to the extent of six or eight per cent. In health, the serous fluid contained in these bags is only enough to prevent friction; but in disease, the quantity is immensely increased, or it is replaced by lymph or pus.

SECT. 2.—CONGESTION AND INFLAMMATION OF SEROUS MEMBRANES.

232. When the vessels which convey the colourless part of the blood are irritated, they become dilated, and the blood at the same time flows more rapidly through them; whilst soon afterwards an increased exhalation of serous fluid takes place, which is either retained within the sac, or else is rapidly re-absorbed. Hence, it follows that a quantity of fluid, sufficient to do great mischief, may be suddenly poured out into the cavity of a serous membrane, and as rapidly re-absorbed; and this explains many sudden attacks of pressure on the brain, resembling sanguineous apoplexy, but which are neither so dangerous or so permanent in their effects as that formidable disease. Hydrocephalus, also, is frequently the result of congestion; and, indeed, the following diseases, which occur from active congestion of serous membrane, show

the importance of attending to their nature. Thus, congestion of the serous membrane covering the brain and lining its ventricles (the arachnoid) produces hydrocephalus and serous apoplexy; of the pleura, leads to effusions of serum, obliterating the lung by pressure, though this is more frequently the result of passive congestion. When the pericardium is the seat, we have fluid interfering with the action of the heart; and in peritoneal congestion there is more or less effusion into its cavity, as is also the case with congestion of the capsules of the various joints.

233. Passive Congestion of serous membranes is generally the result of protracted diseases, reducing the strength of the system, or of mechanical pressure made upon the trunks of the veins which carry off their blood. Such a condition is common enough in some forms of dropsy of the abdomen, depending on a break-up of the system, or in those cases of water on the chest arising in the same way. Here there is no inflammation or active congestion, but the vessels are excessively dilated, and suffer the serum of the blood to ooze through, sometimes even stained with the red globules, and often containing a slight increase of albumen.

234. It is now an undisputed fact, that the serous membrane investing an organ, or lining the walls of the cavity which contains it, may be the subject of inflammation, without its extending to the structures beneath. It is also maintained that a serous membrane covering an organ may be inflamed separately from its adjacent and continuous membrane lining the cavity; and thus many observers pretend to distinguish inflammation of the peritoneal covering of the intestines (enteritis) from inflammation of the same membrane lining the general walls of the abdomen (peritonitis). This, however, is a refinement in diagnosis which is much doubted, and seldom exists, if numberless *post mortem* examinations are to be believed, in which parts of each have been found to be implicated; whilst it is very rare to find one showing marks of inflammation without the other being affected in some degree. The sub-serous cellular membrane always participates; and traces of inflammation in this structure may be observed before they are discernible in the serous membrane, manifesting itself in a red congestion and serous infiltration of the connecting cellular membrane. As the disease advances, the free surface becomes dotted with small red points, and over-run with minute red streaks, which are vessels accustomed to carry white blood, but now dilated sufficiently to admit the red globules. These red dots gradually enlarge till they coalesce and form patches, while the intervals between become opaque and white, and are sensibly increased in thickness. At first all secretion is suspended, or else the serum becomes bloody, or is replaced by pure blood; or, if not very acute, an effusion of pus or of purulent serum takes place. In another form, a jelly-like but albuminous fluid is effused in a thin layer, afterwards becoming thicker and more solid, and sometimes gluing the two surfaces together by forming an organised false membrane, constituting what is called "an adhesion," in the chest or abdomen, as after pleurisy, or pericarditis, or peritonitis. Sometimes the lymph is deposited loosely, forming appendages. Such are the results of acute inflammations, but in *chronic* they only vary in degree. The redness is generally less in them, but the membrane becomes thicker and more dense, and they almost resemble cartilage in their firmness in some cases. In rare instances, the lining surface is rough and granulated.

Sect. 3.—Special Congestions and Inflammations of Serous Membrane.

235. These are—1st, of the head (*arachnitis* and *hydrocephalus*); 2nd, the chest (*pleurisy* and *pericarditis*); 3rd, of the abdomen (*peritonitis* and *enteritis*); 4th, of the synovial capsules of the various joints.

SUB-SECT. A.—CONGESTION AND INFLAMMATION OF THE SEROUS MEMBRANES OF THE BRAIN.

236. ARACHNITIS is the inflammation of the serous membrane covering and lining the brain, as evidenced by various signs or symptoms, including generally great excitement of that organ and its mental manifestations. They are, however, so difficult to recognize, and yet of such direful importance, that few but those who have closely studied numerous cases of the disease can properly appreciate their nature and value. Pure arachnitis, as distinct from inflammation of the pia-mater, is a rare disease, and probably never really occurs, so that the two are generally considered together as *meningitis*, or inflammation of the *meninges* (the coverings of the brain). This commences sometimes with a sudden and violent pain in the head, with loud screaming or convulsions; at others, there is a convulsion alone; whilst in a third set there are no positive convulsions, but only headache and vomiting, with pain in the head. In any case, *coma* soon comes on, and the disease ends fatally, accompanied by squinting and other marks of pressure on the brain. The pulse is sharp, but small, and often not very much accelerated. The heat of the head and the injection of the eyes are the best signs of this disease; but, as I before remarked, it is one which few but the regularly-educated medical practitioner would be likely to recognise, except when too late to afford relief. (See *Inflammation of the Brain.*)

237. HYDROCEPHALUS (*water in the head*) is the disease in which there is a tendency to the effusion of serous fluid into the cavities of the brain, or on its surface; which fluid is poured out from the membranes by transudation, in consequence of congestion or inflammation. As, however, it is rarely found separate and distinct from inflammation of the brain itself, it will be better to include the examination of hydrocephalus with that of the other inflammations of the brain.

SUB-SECT. B.—CONGESTION AND INFLAMMATION OF THE SEROUS MEMBRANES OF THE CHEST.

238. There are three distinct serous membranes within the chest, viz., one on each side, between its walls and the lung, and the other between the heart and its fibrous covering, or the bag which keeps it in its place; and thus we may have inflammation of either one of these three distinct membranes, constituting *pleurisy*, if attacking one or both sides of the pleura, and *serous pericarditis*—that is, inflammation of the serous membrane of the pericardium.

239. PLEURISY is the name given to inflammation of the *pleura;* while by PLEURO-PNEUMONIA is meant a combination of this disease with inflammation of the substance of the lungs, already described. The frequency of the co-existence of these diseases has led to the supposition that pleurisy cannot arise and exist alone; but *post mortem* investigations assure us that, though perhaps rare, such a case does sometimes occur. Nevertheless, it may generally be assumed that pleurisy, when the inflammation extends to that part of the membrane covering the lung, is accompanied by some little pneumonia. Pleurisy occurs in many forms, as will be understood when the following varieties are enumerated—consisting of the acute and chronic forms; pleurisy of one side or both; inflammation of the pleura covering the lung, and that of the membrane lining the walls of the chest; and, lastly, simple pleurisy, and that complicated with pneumonia, or with other organic disease of the lung.

240. ACUTE PLEURISY is accompanied by high fever, which is sometimes of the inflammatory kind, and at others of a low or typhoid character; while the pulse, tongue, and skin correspond with the peculiar nature of the febrile symptoms. But, in addition, there is a marked and lancinating pain in the side, or in both sides, if it should extend to them at the same time, which is not very usual in this disease. This pain is the most constant symptom, and the one which is most dis-

tressing to the patient, and, therefore, never omitted in his description of his sufferings. It is sharp and lancinating, greatly increased on coughing, and on a deep inspiration, also by pressing the point of the finger deeply into the spaces between the ribs, and generally by lying on the affected side. The pain is usually referred to some particular spot, which is rarely larger than the hand, and generally on the front of the chest, or, in tubercular disease, at the upper part, where tubercles, as a rule, abound; the respiration at first is hurried and short, the patient naturally trying to avoid giving himself pain by breathing with as little stretching of the membrane as possible, so that he gives a succession of short jerks in respiration. Afterwards, if effusion has taken place, the respiration is still more difficult and short, but from another cause, namely, the pressure exerted upon the lung by the effused serum. There is a short, *dry* cough; sometimes, however, this is relieved by a thin mucus, and, if pneumonia is present, by the expectoration peculiar to that disease. When water is poured out from the pleura the pain generally ceases; and the difficulty of breathing, together with a prominence of the spaces between the ribs, are the only symptoms which will serve to show what is going on, with the exception of the signs afforded by auscultation, which, however, are so difficult to make out, that the general observer had better omit them from his list. For the sake of curiosity, however, they may be enumerated as consisting, in the early, stage of a peculiar "friction sound," not easily described; and in the latter, of the absence of the usual respiratory murmur, marking, therefore, the presence of some material impermeable to air between the ear and the lung; because, even if it is entirely solidified, the bronchial tubes still give out a sound of some kind. There is also a peculiar tone of the voice, as heard through the stethoscope, which is called *ægophony*, from its resemblance to the bleating of the goat.

241. CHRONIC PLEURISY may either be a sequel to the disease in its more acute form, or it may arise and go through its course without exhibiting the usual active conditions existing in that variety. When this is the case the attack goes on most insidiously, without any apparent fever, and sometimes without any pain in the side greater than that which would be described as soreness. The breathing is also very slightly affected, and the chief external change is in the countenance, which, to an attentive observer, marks the existence of some severe disease. Generally, but not always, there is a dry cough, and almost invariably there is more or less inconvenience in lying on the affected side. Here, then, auscultation alone is a guide, and a pretty sure one, if in the hands of a skilful practitioner, who will at once detect, by a careful examination, the nature and extent of the disease. This chronic form of pleurisy generally occurs in broken-down constitutions, or in those which are by nature of a feeble character.

242. The actual condition of the membrane, as examined after death, does not differ very widely in the two forms, there being in both cases a slight thickening and opacity of its surface, together with more or less lymph thrown out on it, which may or may not be organised. There is also an effusion of a straw-coloured fluid in either case, or of pus itself in very chronic inflammation. In this last case, the disease resembles an abscess, the false membrane lining the pleura corresponding with the lymph thrown out to form the walls of the abscess, and being endowed with the properties of absorption and secretion. When either of the above fluids are poured out in any large quantity, the lung becomes compressed, and shrinks into a mere button of solid matter entirely impermeable to air, and wholly incapable of performing its functions. The former of these conditions is called *water in the chest*, or *dropsy* of that part; while the latter receives the name of *empyema*, for which there is no popular name.

243. PLEURISY, whether acute or chronic, is generally produced by ex-

posure to cold, or by any sudden change of temperature. It is distinguished from pneumonia by the acuteness of the pain, by the absence of the peculiar rusty expectoration, and by the aid of the stethoscope. It is only confounded with one other disease, viz., *pleurodynia*, or rheumatic pain in the muscles between the ribs, which is hereafter to be described.

244. PERICARDITIS, or inflammation of the pericardium, is a disease which requires for its discovery and investigation a knowledge of the stethoscope greater than any but a professional man is likely to obtain. It is, therefore, out of the question for any amateur to be able to treat it with safety; and the following short description of the more ordinary symptoms is introduced, only to serve as a means to its being detected in an early stage, and thus to place it under proper control, before it is too late to relieve it. The symptoms of the acute form are as follows:—An inflammatory fever, accompanied by an acute, pungent, and burning pain in the region of the heart, shooting towards the left shoulder, and running down the arm as far as the elbow. This pain is increased on a full inspiration, or by stretching the left side, or by pressing the fingers deeply between the ribs, corresponding with the situation of the heart. These pains are severe in proportion to the degree of inflammation. There is also an inability to lie on the left side, and often the position on the back is the only one which can be borne. The respiration is very quick and short, accompanied by a dry cough, and by palpitation of the heart, which organ beats very irregularly, and appears to be at times fluttering, and at others bounding in its impulse. The pulse at first is generally full and hard, with a peculiar thrill. After the effusion which follows the inflammation has taken place, these symptoms are modified in such a variety of ways, that it would be useless to attempt a description of them here. Sometimes a large quantity of serum is effused; at others, lymph is thrown out, gluing the two surfaces together, and thus interfering with the free action of the heart, and in some cases in quantity sufficient to compress the organ at the same time. When, therefore, there is reason to believe that the pericardium is thus affected, the sooner the case is placed under a competent medical practitioner, the better for the patient and his friends. Pleurisy and pleurodynia are the two diseases for which it is most likely to be mistaken; and it is only by the exact situation of the pain, corresponding with that of the heart, and by a peculiarly anxious expression of countenance, that the ordinary observer can be expected to distinguish one from the other. These, however, when united to the symptoms above described, if well marked, may enable him to form something like an accurate judgment.

SUB-SECT. C.—CONGESTION AND INFLAMMATION OF THE PERITONEUM.

245. THE PERITONEUM is the serous membrane lining the cavity of the abdomen, and also, more or less, investing the whole of the organs contained in it. For this reason, it is usual to divide the consideration of its inflammations into separate portions, each comprehending that part which covers some particular organ or organs. Thus, the term *peritonitis* proper means inflammation of the membrane lining the walls of the abdomen; while *enteritis* is defined to be the inflammation of that portion which covers the bowels, and generally accompanied by an extension of the mischief to the muscular and mucous coats as well. The serous membrane covering the liver and stomach is also subject to a similar inflammation; but inflammation of the membrane covering these parts has not received a separate name, that of the whole organ, in each case, being respectively denominated *hepatitis* and *gastritis;* while the disease, in which both the stomach and bowels are inflamed, has been denominated *gastro-enteritis*. But as in hepatitis and gastritis the serous membrane is the last to be effected, if at all, the consideration of these diseases is referred to other sections, leaving only *peritonitis*

and *enteritis* to this sub-section, and understanding by the term an inflammation of the peritoneum *alone*, whether lining the walls of, or covering the organs in, the abdomen, although, in the case of *enteritis*, it usually extends to the other coats of the bowels.

246. THE PRESENCE of peritonitis is shown by pain, swelling, and excessive tenderness of the abdomen, the last sensation being increased by pressure of any kind, whether gentle or abrupt, or gradual, yet deep. These symptoms are accompanied by more or less inflammatory fever, with a quick, sharp, and incompressible pulse, and almost invariably by a dry and furred tongue, and *constipation* of the bowels.

247. THE VARIETIES of the disease are numerous, including, as in all other cases, the *acute* and *chronic* forms; the peritonitis of the *infant* and that of the *adult*, as well as the form peculiar to women in child-bed, and called *puerperal*, which will be examined under the chapter treating of the *Diseases of Women*.

248. THE CHANGES OF STRUCTURE produced in peritonitis are—1st, an increased vascularity of the membrane; 2nd, a thickening of its substance; 3rd, effusion of lymph, or pus, or blood, or serum in extraordinary quantity—the three first of which effusions are generally the result of extensive inflammation, while the last may arise from congestion only; and, 4th, gangrene of a most fatal character, which sometimes leads to perforation of the coats of the intestines.

249. ACUTE PERITONITIS IN THE INFANT presents itself from birth upwards, accompanied by the following symptoms:—Excessive restlessness, and constant moaning, or violent crying, with contraction of the features and expression of severe pain. A pointed swelling of the bowels, the apex of which is the navel, evidently caused by wind. There is often vomiting, but not violent, or constant. The bowels are generally constipated. Skin hot and dry, and pulse very frequent, but weak. Tongue furred, but not red at the tip, or edges—a point of distinction from *enteritis*, which is much insisted on.

250. ACUTE PERITONITIS IN THE ADULT generally commences by a *rigor*, accompanied by the usual symptoms of fever, and soon followed by a sensation of heat and pain of the abdomen, which then becomes intense, and is greatly aggravated by pressure, or by the contact of the bed-clothes only. In some cases it requires deep pressure to be made, to detect this tenderness; but in bad attacks the least contact is enough, and the mere approach of the hand will occasion alarm. It is much increased by the erect posture, or by lying on either side, so that the position on the back is constantly maintained, with the legs drawn up, so as to relax all the supports of the membrane. In addition to the pain, there is also great tension and tumefaction of the abdomen, with nausea, or even vomiting, but not generally of bilious matter, except when long continued. Bowels generally costive; pulse very frequent, but small and wiry; tongue covered with a white fur; urine scanty and high coloured; excessive thirst, and great prostration of strength. These symptoms run a very rapid course, and in bad cases are soon followed by a cold sweat, hiccup, excessive anxiety of countenance, low fever, a cessation of the pain, convulsive movements of the limbs, and death. The disease may, on the contrary, end by resolution, in which all the above symptoms gradually disappear. If, however, it goes on, there is effusion of serum, pus, lymph, or blood, which may exist separately, or in combination with each other. The symptoms which indicate effusion are a diminution of the pain, with, instead of it, a sense of weight in the part; occasional chills, pulse becoming soft, countenance paler, and a coldness of the limbs. It is impossible to ascertain during life which of the above fluids has been effused; but it is believed that lymph, blood, and pus are uniformly fatal, never being re-absorbed if poured out in any quantity. When *gangrene* takes place, death occurs, as a matter

of course, its presence being indicated by a total cessation of pain, smallness of the pulse, which also intermits, extreme prostration of strength, and the peculiar parched and shrunk expression of countenance which indicates a fatal disease. Acute peritonitis generally proves fatal within a fortnight of its onset, or else it sinks into the chronic form, rarely ending in death after the above period. It is liable to be confounded with enteritis and gastritis, from the former of which it may be distinguished by the absence of the red edge to the tongue, and by the obstinate constipation which accompanies it; while from gastritis it may be known by the absence of the intense vomiting, which is the sign of that disease. The difference of symptoms, however, is so slight, as to require all the tact and skill of the experienced physician to discriminate between them; and the amateur must not, therefore, hope to be able to attain the power. Rheumatism of the abdominal muscles may be easily mistaken for peritonitis; and it is only by attending to the state of the pulse, to the presence or absence of constipation, and to the tongue, that a mistake can be avoided. In rheumatism, the pulse is full, the tongue is white and moist, and the bowels are readily moved; while the exact opposite takes place in peritonitis. Rheumatic pain is also rather lessened than increased by a gentle pressure with the flat hand, which never gives anything but pain to the inflamed membrane in peritonitis. From colic, it may be known by the presence of fever; from the pain being increased on pressure, whereas in colic it is relieved; by the quick hard pulse, which in colic is full and soft; and by the gradual and constantly increasing nature of the attack, which in colic is abrupt and in paroxysms.

251. Acute Peritonitis may arise from *mechanical* or *constitutional* causes. The former include wounds, blows, pressure from tumours, or by the strangulation of an intestine, either within or external to the abdomen; also extravasations of blood, urine, bile, or fæces, in consequence of some giving way of the sides of the vessels which contained those fluids. The latter comprise the usual causes of inflammation, and also extension from adjacent organs in a state of inflammation.

252. Chronic Peritonitis in the child generally is confined to those of a scrofulous constitution, and is characterized by a constant slight tenderness of the abdomen, aggravated at times to a state of severe pain. There is at first great swelling of the abdomen, which afterwards subsides; pulse rather quick and full, tongue clean, appetite variable, thirst not remarkable, bowels somewhat relaxed, and the evacuations of a whitish-brown colour. These symptoms continue for some weeks, or even months, until at last the child sinks from emaciation, the disease consisting in a complete gluing together of all the intestines by lymph, which is mixed with a curdy and scrofulous matter, and in places broken down by ulceration opening into the bowels.

253. Chronic adult Peritonitis is either a sequel of the acute form, or it arises from the first in its own peculiar condition. In the latter case, it commences in a most insidious way, without presenting any very prominent symptom. Very often there is at first little or no pain; and the first evidence of the disease is the occurrence of a watery swelling of the abdomen, which is distinguished by the fluctuation of the mass on tapping with the finger. This collection of fluid is called *ascites*, or dropsy of the belly, from whatever cause it may arise; but here it is the result of simple inflammation of the peritoneum in a chronic form, or more probably of congestion alone. There is sometimes vomiting, and generally a rapid loss of flesh, with constipation, or in some cases diarrhœa, or an alternation of the two in most cases. When the disease supervenes upon the acute form, the only evidence is the presence of fluid, which is still known as *ascites*. Sometimes we have this collection of serum thrown out as a consequence of congestion alone, caused by pressure on the great veins which carry the blood

back to the heart. Thus, in certain diseases of the liver, there is almost always *ascites* from this cause alone, the membrane being congested by the pressure of the liver upon its large veins, and allowing the serum of the blood to strain through its vessels. Here, therefore, there is a collection of fluid to an enormous extent in some cases, and poured out from the peritoneum, without any of the ordinary evidence of inflammation in the shape of pain. Hence, it is rational to conclude, and we find the opinion corroborated by dissection, that the fluid is poured out as a consequence of pressure alone, while the state of the peritoneum is described as that of congestion, not inflammation. Of course this is a point of great importance in the treatment of the disease, and should by no means be neglected by the observer who wishes to avoid a fatal mistake.

254. **Enteritis**, as distinguished from *peritonitis*, means an inflammation of some part of the serous coat of the intestines; and as the functions of these organs vary considerably in the small and great intestines, so the inflammation affecting these two primary divisions will be very different in its symptoms. Thus, when both the stomach and intestines are inflamed, we generally have the severe disease, known as *bilious* or *gastric fever*, or by some called *gastro - enteritis*. When the *duodenum* is alone the seat of inflammation, digestion of food is impeded, and sickness is the result. When the small intestines generally are inflamed, we have constipation, and severe pain and fever; while, if the lower or larger intestines are attacked by the disease, diarrhœa or dysentery very frequently occur. In addition to these leading points of distinction, when the duodenum is attacked, along with pain after eating, slight vomiting, small and quick pulse, and red and dry tongue, there is also the appearance of jaundice, in degree varying with the intensity of the inflammation. If the other small bowels are implicated, there is commonly a red and shining tongue, great thirst, tenderness on pressure, and flatulent swelling of the abdomen, pulse small and frequent, and loathing of food, but no vomiting. The bowels are generally confined, but sometimes diarrhœa exists in this complaint. Inflammation of the cæcum and colon are not to be distinguished from dysentery, the account of which may therefore be examined at par. 160.

255. **Chronic Enteritis** in children is very often mistaken for the effects of worms, and mal-treated by the exhibition of purgatives for their expulsion; and it, therefore, requires great caution in the use of the medicines which are popularly employed when worms are thought to be present. The symptoms are very similar, and few people are able to decide with certainty, unless the parasites themselves are made apparent. There is, however, generally more constitutional disturbance in the early stage of chronic enteritis than in "worms," and the sympathetic effect on the brain and lungs is also more manifest. Indeed, it generally leads to *infantile remittent fever*, which may be found described at page 29.

256. Beyond the above limited set of symptoms, it is of little use attempting to enlighten the general observer on the nature of the obscure inflammations which attack the various parts of the alimentary canal, as it would only lead to his bewilderment, and serve no good purpose whatever. Indeed, in all cases, the best thing which an unprofessional person can do, when enteritis or peritonitis are either of them even suspected, is to call in the first medical aid within reach.

Sub-sect. D.—Inflammation and Congestion of the Synovial Capsules.

257. **Acute Inflammation of the Synovial Capsules** may be the result of mechanical injury to them, or it may arise from constitutional causes. Blows, strains, cuts, and punctures are the chief injuries to which these membranes are liable; while extension from rheumatic inflammation of the fibrous capsules may be set down as the most frequent constitutional origin. Any of the joints may be the seat of this disease from injury to them; but the knee is almost

the only one which suffers from any other cause. The symptoms are severe aching pain in the joint, aggravated by the slightest motion, great swelling coming on *almost as soon as the pain itself*, redness, and tenderness, together with fever of a highly inflammatory character. The swelling is peculiar, and varies according to the joint affected, so that if this is superficial the swelling is so too, and allows fluctuation to be distinctly perceived. Where the ligaments are deficient the swelling appears prominently, so that the shape of the joint is entirely altered; and hence, in inflammation of the knee-joint, the patella, instead of being prominent, is lost in a bed of yielding fluid. In the elbow-joint the swelling is most marked behind and above the point of the elbow.

258. CHRONIC INFLAMMATION of the synovial membrane differs only in degree from the acute form, there being a similar swelling of the joint, but the pain is much less severe, and it is not aggravated on pressing together the two bones which form the joint. The pain also precedes the swelling several days, and is sometimes wholly absent, the disease then appearing without any warning, and wholly unattended with fever, constituting what is called dropsy of the joint. If this chronic inflammation is neglected, thickening of the membrane takes place, and the mischief extends to the ligaments and cartilages, so that the joint becomes perfectly stiff.

259. INSTEAD OF A SEROUS FLUID being poured out into a joint, pus is in rare cases secreted by the lining membrane, and then we have what is called abscess in the joint; but this is wholly distinct from the scrofulous disease which often takes place in the joints, in which the bone is carious, and the cartilage ulcerated.

260. In addition to the above inflammation of serous membranes, there are those caused by mechanical injury, such as cuts, &c., and always greatly aggravated by exposure to the air. Indeed, it appears that this is the chief cause of the inflammation produced, and that, without the contact of air, many severe wounds of serous membranes would be borne with comparative impunity.

CHAPTER XIII.

INFLAMMATION OF FIBROUS AND MUSCULAR TISSUES.

SECT. 1.—STRUCTURE OF FIBROUS AND MUSCULAR TISSUE.

261. A considerable part of the body is made up of a strong fibrous tissue, which is destined to the sole purpose of keeping the various parts together. This is altogether different from muscular fibre, which is full of blood, and endowed with remarkable vital properties, as evinced in the powerful contraction which takes place on the proper stimulus being applied; whereas the fibrous tissue is wholly unyielding, and continues to maintain the same length and breadth under all circumstances. It forms the ligaments which bind one bone to another, and also the tendons by which the fleshy muscle acts upon the bone in situations where its own bulk would be in the way. Fibrous tissue is either white or yellow, the former being composed almost entirely of gelatine, and it is therefore soluble in boiling water, while the latter has no gelatine in its composition, and is not affected by any length of boiling in water.

262. MUSCULAR FIBRE consists of a delicate tubular sheath arranged in cells of a peculiar shape; and by experiment it is ascertained that, when the muscle is relaxed, these cells have their long diameter in one direction,

whilst during contraction it is exactly the reverse. Thus, it seems probable that the act of muscular contraction consists in a change of form in the cells of the fibrils of the muscle, consequent upon an alteration between the walls of their two extremities. All muscles are largely supplied with blood, and in proportion to their employment is the abundance of the flow into them. This fluid is not driven there without some object; but it is the chief means of obtaining the contraction, for we find that, unless the blood is healthy and thoroughly depurated on passing through the lungs, the proper contractile power does not continue in the muscular structure. Every act of contraction involves the destruction of a certain amount of muscular tissue, which is only repaired by an act of nutrition at the expense of the fibrine supplied to it by the blood. It is for this reason that in most of the muscles, after a certain degree of exertion, rest is required, in order that the repairs may go on without difficulty, just as in the case of any ordinary machine, it is thrown out of work for the same purpose; and for this reason the sensation of fatigue is implanted by the Creator, in order to prevent the risk of injury from over-exertion. In those muscles which are not under the control of the will, and which are constantly in action, there is not the same chance of over-stimulation, nor is there the possibility of allowing a total cessation from rest, and the repair is obliged to go on during their employment. The muscular system is composed of three sets—1st, those under the control of the will, called *voluntary;* 2nd, those acting under the control of the nervous system, but independent of the will, and therefore called involuntary; and 3rd, of those which are sometimes voluntary, but usually carry on their actions without the control of the will. When the muscles of the body are subject to either of these controlling powers in a healthy manner, all goes on well, as far as that part of the system is concerned; but if the blood is congested in them, or the nervous stimulus is lost or irregular, their contractions are either permanently continued beyond the influence of the controlling power, producing what is called *tonic spasm*, such as that which is usually known as "cramp," or there is an irregular and jerking contraction, of which a familiar example is seen in the ordinary "convulsions" of children, in which the muscles are alternately violently contracted, and then completely relaxed; or, lastly, there is a loss of all contraction, constituting what is called *paralysis.* In proportion to the healthy use of any set of fibres will be their nutrition, so that their complete rest produces a wasting of their substance; while, on the other hand, their constant exercise leads to a corresponding development and increase of size. All these facts must, therefore, be taken into consideration, in examining the inflammatory diseases to which these organs are subject.

SECT. 2.—INFLAMMATION OF LIGAMENTS AND TENDONS.

263. Inflammation of these structures may be either acute or chronic, both being described as *gout* or *rheumatism*, according to the character of the disease; and as these structures are chiefly confined to the joints, this kind of rheumatism is called *articular*, or sometimes *rheumatic gout.*

264. I have already shown that inflammation is almost always accompanied by an excess of fibrine in the blood; but for the production of gouty or rheumatic inflammation, the presence of another substance in it seems to be essential. Instead, therefore, of looking upon gout and rheumatism as inflammation of fibrous structure, it is perhaps more philosophical to consider them as really diseased conditions of the blood, which have a tendency to expend themselves upon fibrous tissues under the forms of gout or rheumatism; and hence it is that local treatment is so useless in these cases; and, indeed, it is not only useless, but it is often prejudicial, so that it is necessary to be very cautious in interfering with any local manifestation of the internal blood disease, such as is

exhibited in any ordinary attack of gout, or acute rheumatism. This theory of the nature of this intractable disease accounts for their frequent shifting from joint to joint, which would otherwise be wholly unintelligible; and in the same way it explains the spreading of the inflammation from the fibrous to the cellular and serous membranes, which are, indeed, also sometimes primarily affected. The peculiar change in the blood, upon which these diseases depend, is not easily made out, but very often there is an unusual quantity of lithic acid developed, as is shown by the deposit of a brick-dust coloured cloud in the urine after settling. Nevertheless, this is not always the case, and therefore it is not by itself sufficient to account for the disease. It may, however, be stated, that gout and rheumatism are always connected with imperfect digestion, assimilation, and excretion, so that the blood is impaired in quality by the introduction of badly-prepared elements, and by the non-removal of others which have imperfectly done their allotted work. Nothing is more certain than that, by improper feeding, we can alter the habit of the body, but we cannot always thereby produce any particular alteration; and thus it will be found that the same high feeding and want of work, will in one person produce gout, in another acute rheumatism, in a third diseased liver, and in a fourth mere dyspepsia, with loss of appetite, and consequent cutting off of the supplies, by which further injury is prevented. But, if gout is hereditary in the individual, it is easy enough to promote its development; and, indeed, the chief difficulty consists in preventing it, so that in many cases it will show itself in spite of every precaution. From these considerations, therefore, it must be understood that, although gout and rheumatism show themselves by chiefly attacking fibrous and muscular tissues, yet they are really of a constitutional origin, and depend chiefly upon errors of diet and want of a due amount of exercise, either in the individual attacked or in some of his progenitors. This constitutional tendency to either of these diseases is called the gouty, or the rheumatic diathesis, as the case may be.

265. MECHANICAL INJURIES to fibrous and muscular tissues do not, of course, necessitate the previous existence of a peculiar diathesis, in order to develope inflammation; but it is notorious that, if such a state exists, slight injuries are followed by much more severe consequences than would be the case without it. Thus, a slight strain of a sinew, or a similar sprain of a ligament, in a rheumatic or gouty person, is always a serious affair; whilst it would pass away in a few days in a thoroughly healthy subject. With regard to cuts or ruptures of muscular or tendonous fibre, much depends upon their exposure to the air; for it is found that, if muscle or tendon is divided by the knife, without the air having access to the divided surfaces, no inflammation ensues, and lymph is only poured out for the purpose of cementing together the ends by means of "union by the first intention," as it is called. (*See* par. 124.) If, however, there is a wound in which a torn or cut surface of fibrous or muscular tissue is exposed, even in a healthy person, the inflammation is high, and goes far beyond the point necessary for union, ending in granulation, and the ordinary discharge of matter which accompanies that process.

SUB-SECT. A.—GOUT.

266. THE GOUTY DIATHESIS is chiefly shown by more or less dyspepsia, with uneasy feelings about the region of the stomach. There are also very generally *twinges* of pain, for which no reason can be given, occurring about some of the joints, and not aggravated by motion or by pressure. But usually the feet are exceedingly tender, or, indeed, any part which is more than commonly in use; and as these, in walking, bear the brunt of that exercise, they suffer in proportion to its extent. The slightest irregularity of diet produces uncomfortable feelings, not only in the stomach, but in the feet, and sometimes in other joints

also. There are also some eructations and flatulence after a badly-digested meal, and at the same time the temper is upset and the spirits depressed. The skin is also affected by itching, especially on the back and shoulders, and often by obstinate eruptions. Sometimes the diathesis is the sole result, and no further mischief ensues; but generally what is called a paroxysm of gout makes its appearance, or else a chronic deposit takes place in the neighbourhood of a joint, which has received the name of "chalk stones."

267. THE PAROXYSM OF GOUT at first shows itself by attacking a single joint, usually one of the small ones of the foot or hand, and, perhaps most frequently of all, that at the root of the great toe. But in cases of long standing all the joints are in their turn liable to be affected by it, and sometimes several are attacked at the same time. There is almost always some degree of fever of an inflammatory type, the extent of it being in proportion to the local disease. The paroxysm has a natural tendency to get well, but in its course it leaves its mark in the shape of thickening of the fibrous tissues, or of an effusion of fluid into the capsule, as shown in the last chapter, or in a deposit of what is called a "chalk stone," or of many of them, around the joints. Suppuration rarely occurs, but sometimes true anchylosis or bony union takes place, from a destruction of the cartilages at the ends of the bones, constituting a stiff joint. Chalkstone is a lithate of soda, and it is generally deposited on the joints of the hands rather than on those of the feet. The deformity is often very great; and, besides the tumour, there is also a giving-way of the ligaments on the same side, so that in almost all cases there is an unusual angle made, which in the hands is very remarkable, and leads to great deformity. Sometimes the skin over these deposits becomes ulcerated, and their contents escape in the shape of a white creamy matter. Gouty paroxysms frequently seize upon the muscular coat of the stomach, the nature of the attack being of a spasmodic character, arising probably from congestion, as there is no evidence of inflammation in such cases either before or after death. Other diseases are said to be of a gouty character—that is to say, they occur chiefly in persons of a gouty diathesis, but it is scarcely necessary to allude to them here. In a true fit of the gout, the skin is of a peculiar pinky-red, resembling in colour and shining surface the interior of the large sea-shells which used to ornament our mantel-pieces in "days of yore." There is great heat of surface and swelling, with sharp lancinating pain, and such excessive tenderness, that not the slightest touch can be borne. The pain is described as of a peculiarly grasping or tearing character, and is compared to red-hot fish-hooks pulling in all directions. After this inflammatory condition has lasted for some days, it gradually subsides; after which the cuticle peels off in very thin layers, and the veins remain distended for some considerable period, but the pink colour has entirely disappeared.

268. ATONIC OR LOW GOUT sometimes occurs, and more especially in those who have long been subject to the gouty diathesis, but whose strength is reduced by powerful lowering medicines, such as colchicum, given with a view to relieve the disease. Here the paroxysms occur without fever, but the local affection is nevertheless nearly as painful and as severe as the inflammatory form described above. There is no chalk-stone deposit in such cases, nor is there any red sediment in the urine; and the probability is that the attack is wholly of a congestive nature.

SUB-SECT. B.—RHEUMATIC INFLAMMATION OF FIBROUS TISSUES.

269. THE RHEUMATIC DIATHESIS is very similar in its nature to the gouty, but it first occurs chiefly in people under thirty, or, at the utmost, forty years of age. There is a feverish state of the system, varying in intensity in different individuals, and indicated by increased quickness of the circulation, with perspirations of an acid nature, as shown by their odour and their effect upon certain colours in the

clothes. Red deposits in the urine are also present, or sometimes of a yellowish or whitish colour. The first complaint made by the patient is generally of pain in the joints, not always accompanied by swelling or heat, but generally increased on motion. This pain also extends to any of the muscles which are used, so that after walking or using the arms they are very painful, or in minor cases, give that aching sensation which so many young people suffer from, under the name of "growing pains." This may go on for a long time; but at last, from some "cold" or from some local mischief, an attack of rheumatic inflammation is set on foot, which rapidly goes on to develop its peculiar results in some one or more organs, which may be either the fibrous tissues about the joints, producing acute articular rheumatism, rheumatic fever, or rheumatic gout, or perhaps chronic articular rheumatism; or it may attack the muscles in an acute or in a chronic form, resulting in what is called muscular rheumatism, each of the foregoing being generally considered a separate disease, though really only a particular condition or stage of the constitutional derangement of the fluids of the body, upon which the whole set depend.

270. ACUTE ARTICULAR RHEUMATISM, sometimes called *rheumatic fever* and *rheumatic gout*, is a most painful and severe inflammation, which, though often confounded with others of a totally different character, is, when really present, of a nature which cannot be mistaken by the careful observer of disease. It is always preceded or accompanied by the rheumatic diathesis, which sometimes wears itself out, but generally shows itself in a paroxysm of fever, with inflammation of some joint or joints, and receiving the above names. There are often, but not always, *rigors;* and the first symptom which presents itself is a swelling of one or more joints, with great pain and stiffness, the pain being aggravated at night. The ankle is generally the first attacked, or in some cases the knee; then follows the elbow, wrist, and shoulder; and lastly, comes the hip-joint, which is more rarely the seat of this disease than any other. It does not follow that all the joints shall be attacked in the same individual, but very often each has its turn, and the above is a very common order of the succession in the attacks. Soon after the onset of the inflammation the swelling is very great, with a slight degree of redness at one or two points, very gradually shading off into the usual colour of the skin. When the disease runs high, and more than one joint is affected, the body is often obliged to be kept perfectly still on account of the pain felt on the slightest motion; and to such an extent is this carried, that I have known patients lie on their backs for many days together, without moving hand or foot, and only able to open their eyes and use their tongues and their powers of swallowing, which remained unimpaired. The fever is of a peculiar character, the skin being hot, with the most profuse acid perspirations, which last for hours, and yet give no relief. The tongue is moist, soft, and covered with a thick, white fur; thirst considerable; pulse full and hard; and the urine loaded with red deposits (lithate and purpurate of ammonia). When the inflammation of the joint first attacked has existed for a day or two, it is almost sure to shift itself to another, in the order mentioned above, or very nearly so, until at last the disease has expended itself, and the joints recover their former shape and size, rarely being injured in structure, unless from bad treatment. Sometimes the heart becomes affected by the transition of the inflammation to it from some of the joints; or it appears that it may sometimes be affected as the sole organ inflamed, concurrently with rheumatic fever. This, however, is the exception; and the rule is, that rheumatic affection of the heart follows upon articular disease. Indeed, it has been supposed by careful observers of the complaint, that in every case, prior to twelve, the heart is more or less affected; but this, I am quite sure, from my own experience, is fallacious. An attack of articular inflammation has unfortunately the tendency to be reproduced, which is not to be wondered

at, when it is remembered that it is a constitutional disease, and that the diathesis from which it arises is permanent. Unless, therefore, this constitutional tendency to rheumatism can be effaced, there is every probability that the attack will return again and again at uncertain periods.

271. CHRONIC ARTICULAR RHEUMATISM is a truly formidable disease, from the pain and distress which it occasions, from the interference which it exercises with the bodily powers, and from the difficulty which exists in combating it by any means, medical or otherwise. It does not confine itself to any joints in particular, but all are liable to it. The hip-joint is the one where its ravages are felt most severely, and where it causes the most disturbance, from the important part which it plays in all the movements of the body. The disease shows itself at all ages, from twenty to extreme old age, but before thirty-five or forty it is not very common. Whenever it affects more than one joint, it is clearly constitutional, and has its origin in a rheumatic diathesis. Sometimes it follows rheumatic fever at periods more or less remote; in others, it comes on without any such precursor, and the joints gradually stiffen. The symptoms are evidently of a rheumatic character, the pains being most at night, and also on each change of weather. There are no deposits of chalk-stones, as in gout, nor is there any change of structure appreciable to the eye or touch during life, except as far as a thickening of the ligaments may be so considered, which almost always takes place. If the hip is the seat of the rheumatic affection, the limb on that side is shortened by the gradual absorption of the cartilage, and of the head of the bone, and, as a consequence, great lameness ensues. The foot is always everted; and so peculiar is the gait, that a person afflicted with chronic rheumatism of the hip-joint, may be distinguished while walking at the distance of some hundred yards. If the hands are affected, still greater alterations of form in the fingers occur than in the gouty state, with its chalk-stone deposits. The cartilages are worn away, the ligaments are destroyed, and the joints are dislocated, so that they are forced out of their natural position, and are often forcibly drawn away from the thumb, which seems to follow them in the most helpless manner. The hip-joint disease is almost peculiar to old men, while the hand is generally attacked in women of from forty-five to fifty-five years of age.

SECT. 3.—CONGESTION AND INFLAMMATION OF MUSCULAR FIBRES.

272. RHEUMATISM OF CERTAIN MUSCLES is very common, as, for instance, lumbago and wry-neck, which are clearly instances of this affection. It appears to consist in congestion rather than inflammation, as there is no change of structure; and the attack often goes off in a few hours, leaving only a slight weakening of the part. The abdominal muscles are, likewise, frequently the seat of rheumatism, as are also the muscles between the ribs (*intercostal*), which are the seat of an affection called *pleurodynia*, or stitch in the side. This last name (stitch) is, however, generally given to a mere temporary spasm of these muscles, brought on by over-exertion, and not to the settled pain, which is liable to be confounded with pleurisy, and which has received the name of pleurodynia. Any of these muscular forms of rheumatism may be detected by the absence of the peculiar symptoms attendant upon those diseases with which they are liable to be confounded; and also by the increase of pain on putting the affected muscle into play, or by pressing upon or pinching it between the fingers. Thus lumbago is aggravated by the slightest motion, since the back is a part which is called into play on the slightest action of any one of the limbs; but, if the body itself is moved, the pain becomes intense. Turning in bed is wholly out of the question; and deep pressure made on the loins is productive of acute pain. In wry-neck, the head is carried on the opposite shoulder, because the affected muscle is rendered painful on the slightest stretching of

its fibres; and in the same way, when the abdominal muscles are the seat of the rheumatic affection, if the body is attempted to be raised from the bed, unassisted by other means than the muscles themselves, the pain is most exquisite, as it also is if the hand is pressed upon them.

273. **Cramp** is an irregular contraction of certain muscles, especially of those of the leg, and is most probably generally due to some degree of congestion in their blood vessels, although the supply of nervous power may, in this instance, be the cause. It is a most painful affection, and not much within the reach of remedial measures.

274. **Colic** is a spasmodic or crampy affection of the muscular coat of the intestines, without inflammation or fever. It is accompanied by great pain, with intervals of rest, obstinate constipation, and very often vomiting. At first there is only slight pain felt occasionally round the navel, which is relieved by pressure and deep rubbing. It is brought on either by the use of improper food, such as large quantities of salad or other indigestible matter, or by cold applied to the body when heated, or by collections of fæces in the bowels, which last is very apt to produce it in young children and infants; and sometimes by the poison of lead, when it receives the name of *painter's colic*. It may readily be distinguished from inflammation of the bowels by the paroxysmal character of the pain, by the absence of fever, and by the pain not being increased on pressure, but rather relieved. Spasm of the superficial muscles of the abdomen may be mistaken for it; but the two may be distinguished by tapping the abdomen with the fingers, when the pain will be increased if the abdominal muscles are the seat, but will be unaffected by it in colic. Sometimes it is complicated with *intussusception*, which is a dragging of one portion of the bowel into the next, like the inverted finger of a glove. Here the symptoms begin with those of colic, but they are perfectly unyielding, and end with those of inflammation of the bowels. Colic is most probably due to passive congestion.

275. **Hiccup** is another species of spasm, occurring either in the longitudinal fibres of the œsophagus, or in the diaphragm, which is the broad layer of muscle that divides the chest from the abdomen. Every one must be aware of the outward nature of this troublesome affection, which is very apt to attack young people after a full meal, and is then, in my opinion, undoubtedly caused by a spasm of the longitudinal fibres of the gullet. Hence, it is generally relieved for the time by swallowing, and especially by taking a piece of dry bread or white sugar. When, however, it is met with in the last stage of certain diseases affecting the nervous system, I believe it to depend upon spasm of the diaphragm, and, in that case, the ordinary remedies are of no avail.

276. **Spasmodic Contraction** of the circular fibres of the gullet is also sometimes met with, in which there is a sense of choking during eating, and very often an inability to swallow any morsel of a size bigger than a pea. It is very apt to occur in hysterical women.

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CHAPTER XIV.

INFLAMMATION AND CONGESTION OF THE BONES.

SECT. 1.—STRUCTURE OF BONE.

277. THE BONES are the frame-work of the human body, giving firmness and strength to the entire fabric, affording levers for the actions of muscles, and protecting internal organs. In the limbs they are hollow cylinders, and are thereby calculated to resist violence without unnecessary increase of weight. In the body and head they are flattened, but in an arched form, so as to protect the organs contained in their cavities from external violence. Hence, it follows that they are liable to all sorts of injury from violence, causing bruises and fractures of their substance, and, in addition, they are liable to inflammations and other specific diseases, which generally depend upon some constitutional defect.

278. BONE IS COMPOSED of about one-third of animal matter, and two-thirds of earthy and saline materials, the exact proportions of which are as follows:—

Cartilage and blood-vessels	33.30
Phosphate of lime	51.04
Carbonate of lime	11.30
Fluate of lime	2.00
Magnesia and soda	2.36
	100.00

Bone is a dense compact substance, filled wth minute cells, scattered throughout its texture. Bones are partly solid and partly hollow, or cancellated—that is, composed of a spongy substance, almost like a honeycomb, but with irregular instead of geometrical cells. The earthy matter is capable of being dissolved by weak mineral acids, leaving the bone still of the same shape and external appearance, but soft and yielding to the slightest force. On the other hand, by burning, the animal matter is got rid of entirely, leaving the earthy materials in a state resembling a light and porous unglazed earthenware. Boiling water also dissolves out the greater part of this animal substance, converting it, at the same time, into gelatine; and in this way, bones from butcher's meat, when boiled, produce an excellent soup, only deficient in the substances peculiar to muscular tissue. Bones are all traversed by canals, which give passage to minute blood-vessels; and the spongy parts of all bones are absolutely full of blood-vessels, so that congestion and inflammation of their structures are common enough.

279. BONES ARE COVERED by a thin but dense fibrous membrane, the *periosteum*, which encloses them on all sides, except where covered with cartilage, as at their extremities, where they require smooth yet elastic surfaces to form the joints of the body. On the head, this investing membrane is called *pericranium*, and inside the skull *dura mater*, though still of exactly the same structure as elsewhere.

280. ALL BONES are developed originally in a gelatinous form, which subsequently becomes cartilage, and then receives the lime, which hardens them, and renders them firm, and capable of resisting the shocks to which they are subject. Sometimes there is too little lime, and then the bones are too soft and yielding, as in *rickets;* and at others, lime predominates too freely, constituting a disease known as too great *brittleness of the bones.*

281. TEETH are partly formed of bony matter, and partly of a harder substance, called enamel; but their mode of formation is wholly different from that of other bones, being actually produced from little bags in the mucous membrane of the mouth. This, however, can only be seen some months before birth, when the jaw presents two semicircular folds of membrane, the external of which is the future lip, while the internal corresponds with

the palate, and between them is a deep groove in which the rudiments of the future sockets of the teeth may be seen, as well as the small *papillæ*, which are the first rudiments of the future teeth. After a time each papilla is enclosed in a prolongation of the mucous membrane, forming a bag at first with an open mouth, but afterwards closed, and containing within this sac the pulp, which subsequently becomes bony matter, and has deposited upon it the enamel, which is a secretion from the lining membrane of the sac.

282. EACH TOOTH is composed of three distinct textures,—1st, *ivory or tooth-bone;* 2nd, *enamel;* and 3rd, *a cortical substance, called cementum.* The bone forms the body of the tooth, and appears to consist of very minute tapering and branching fibres embedded in a dense substance, and containing more mineral matter than bone. The *enamel* forms a hard crust over the whole exposed surface of the tooth, and is the thickest where most exposed to attrition. The *cortical substance* is a thin covering over the root of the tooth, extending from the enamel to the point of the fang. In structure it is analogous to bone, and has less mineral matter than the body of the tooth. Each fang has a central canal through which the vessels and nerves pass to a small cavity in the centre, which is lined by a continuation of the periosteum, and is liable to inflammation, accompanied by the intense pain known as toothache.

SECT. 2.—INFLAMMATION AND CONGESTION OF BONE, AND THEIR CONSEQUENCES.

283. THE BONES are subject to much the same conditions of their blood-vessels as the cellular tissue, modified only by the greater hardness of their fibres, which prevent swelling. Thus, we may have simple congestion, with its attendant pain, heat, and redness, but without any further change; or we find inflammation, both acute and chronic, resulting in softening, or suppuration, or ulceration, or in mortification; the two last being called *caries* and *necrosis*.

284. ACUTE INFLAMMATION of bone generally follows an attack of "severe cold," caused by extreme exposure to the weather. It sets in with the usual fever, *rigors*, &c., attending on all inflammatory affections, and the part affected is most acutely painful, with tenderness of the bone and swelling of the skin and other coverings. This goes on until either an abscess forms under the *periosteum*, or a death of part of the bone takes place, which may be known by the gradual enlargement of the body of the bone, and by the thickening of the soft parts round it. The disease, however, is so seldom met with, that it need scarcely be further described here.

285. CHRONIC INFLAMMATION of bone is generally met with in scrofulous subjects; and, though showing itself in one or more situations, is only a symptom of a constitutional disease. There is a slow enlargement generally of the head or end of some bone, with a sensation of weight, tenderness, and pain. This may either continue for some months, and then gradually subside; or it may end in *caries* or *necrosis*, or sometimes in chronic abscess, the matter showing iteslf under the periosteum, and finally making its way to the surface. The ends of the long bones, and the short spongy bones, are those which are principally the seat of this disease. What is commonly called "a white swelling" is an instance of this disease, attacking the knee-joint, and ending in *caries* of the spongy texture of the end of the bones, with destruction of the cartilage covering them. "Spinal disease" is another form in which the bones of the back inflame, and become carious. (See *Scrofula.*)

286. INFLAMMATION OF THE PERIOSTEUM often occurs in scrofulous subjects, or as a consequence of blows in health, or from the abuse of mercury, or from diseases arising from excesses of different kinds. Swellings take place of various sizes and forms, but generally on parts which are covered with skin only, and remain for some months or years, after which, if the health improves, they gradually

disappear. Such swellings are called *exostoses*, and the inflammation which precedes their appearance, *periostitis*.

287. Abscess of Bone is a rare consequence of inflammation; but it happens sometimes after acute diseases, such as small-pox. It may be suspected where, in addition to permanent inflammatory enlargement, there is a fixed pain in one spot, aggravated at night, and incapable of relief by any remedy. It requires, however, a skilful surgeon to make sure of its existence.

288. Caries results from an unhealthy inflammation, which first causes a softening of the structure, and then an ulceration, and discharge of pus. The bone becomes soft and red, its cells being filled with bloody serum, surcharged with albumen. After a time matter is formed, and absorption takes place towards the surface, allowing its discharge, and carrying with it the broken-down fragments of the bone in minute scales. When caries occurs in the tooth, it gives rise to most painful symptoms, called "toothache;" but this will be better considered under *the diseases of the mouth.*

289. Necrosis is a form of mortification of bone, only occurring in the substance of the long and hard bones—the spongy ones, when inflamed to the same extent, becoming carious instead, and the death of the surface only being called *exfoliation*. When necrosis occurs, the shaft of the bone dies; but to enable its duties to be performed, new bone is thrown out around it, imprisoning the dead portion, which is then called *sequestrum*, and of course enlarging the limb very considerably. It is a common disease enough in young people, and generally requires an operation for the removal of the *sequestrum.*

290. Exfoliation of bone signifies the death of a superficial layer only, and not of the whole shaft of the bone. It is generally caused by some injury, such as the stripping off of the periosteum in amputation, or when the skin and pericranium are torn off together; but whatever the cause is, the shell dies, and is displaced by the growth of granulations beneath it, pushing it out of its place.

291. In Fractures of the Bones, inflammation is set up as the first step to a repair of their original form. From the broken ends and adjacent parts a soft gelatinous mass is poured out, called a *callus*, which speedily becomes organised, and glues the broken portions together; but for a long time, varying from three weeks to eight or nine, continues soft and pliant. Gradually, however, the mineral elements of bone are deposited in it from the blood-vessels which run through its substance, and at last the bone is as firm as before, but still showing a large lump of bony matter around the place where the injury existed. This enlargement is gradually removed, until, in the course of time, if the ends of the bone are exactly in apposition, no deformity whatever remains. Sometimes, however, if the limb is not kept still during the formation of the callus, or if the constitution is very feeble, no union takes place between the two ends, and the result is the production of what is called a false joint.

292. Anchylosis is a desirable termination of ulceration or caries of bones, in which the cartilage covering their ends is removed. It may be either *true* or *false*, according to the nomenclature of the surgeon. If *true*, lymph is thrown out from the two ulcerating surfaces, blending together into one mass and becoming organised, and, finally, having earthy matter deposited in its substance, by which the two bones become one. *False* anchylosis is merely an unnatural immobility of a joint, owing to the stiffness of its ligaments, which are pliable in a state of health, but which are rendered otherwise in a state of inflammation.

CHAPTER XV.

INFLAMMATION AND CONGESTION OF THE GLANDS AND ABSORBENTS.

SECT. 1.—STRUCTURE OF THE GLANDS.

293. THE GLANDS OF THE BODY may be arranged in two primary divisions, consisting of—1st, those which secrete some particular fluid for the use of the machine, such as the liver, which secretes the bile and purifies the blood; the kidneys, which secrete the urine; and the salivary glands, from which the saliva results;—and, 2nd, the absorbent glands and vessels, which are employed in removing the worn-out materials.

294. THE LIVER is the largest gland in the body, and the most important in its uses during health, while its diseases are second to none in their effects upon the life and happiness of mankind. It is what is called a compound gland—that is, it is made up of a number of little glands, bound together by cellular or areolar tissue, and appearing to the eye externally as one mass of substance, alike in its materials. Each of these little glands (or lobules), about the size of a millet-seed, is composed of a branch of the hepatic artery and vein (the vessels specially appointed to nourish the liver), of a branch from the portal vein (that which returns the blood from the intestines through the liver to the heart), and a branch of the duct which carries the bilo off from the liver when formed by the cells. It appears now to be pretty well ascertained that the bile is entirely secreted from the venous blood, either of the portal system, or that contained in the hepatic veins, after passing into them from the artery. Hence, it follows that every impediment to tho flow of blood from the liver to tho heart is apt to produce congestion of the former; while, on the other hand, obstructions in the liver itself react upon the heart, and produce irregularity in its action, often to the extent of intermittence in its beats. When the bile is thus secreted from the venous blood, it passes onwards through its duct, until it meets with another, which unites with it, and allows the fluid, when not wanted, to flow back into a convenient reservoir, the gall-bladder. But if demanded for present use, or if at any time required, the two ducts pour out their bile, which then passes on into the duodenum, through a valvular opening, and is at once mixed with the partially digested food, to form what is called chyle.

295. THE PANCREAS is a long gland, similar in appearance to the salivary glands, and secreting a fluid not very unlike saliva in its office and composition, and intended, no doubt, to complete the digestion and assimilation of the food. Nevertheless, its diseases are of such a nature, that they cannot often be made out, even by the skilful physician, and are, therefore, entirely out of place here.

296. THE SPLEEN is apparently a magazine of blood, for the purposes of digestion, when required; but as this is purely a theoretical opinion, it is useless to dwell upon it. Of its diseases, under ordinary circumstances, little is known; and they need not occupy our attention here.

297. THE KIDNEYS come next in importance to the liver, being the organs which secrete urine. They are situated on each side the spine, extending from the eleventh rib to the upper edge of the hip-bone. Each is about four or five inches in length by about two and a-half in breadth, and weighs about five ounces, more or less. They are invested by a fibrous capsule, which is easily torn off, and if divided by the knife, they are seen to consist of an external vascular portion, and of an internal or tubular substance. Tho vascular portion is mado up of blood-vessels, and of the convolutions of the little tubes, in which the urine is secreted, while the tubular is made up of conical bodies, which receive tho fluid and carry it into the central cavity

(pelvis), from which it passes through a long and narrow tube on each side (the ureter) to the bladder, entering it obliquely, so that when distended, there is no possibility of regurgitation.

298 THE SALIVARY GLANDS are three on each side of the jaw (one beneath the tongue, another beneath the jaw, and a third behind the jaw and just below the ear), severally called *sublingual*, *submaxillary*, and *parotid*. They open into the mouth by separate ducts, and secrete the fluid known as saliva, which is mixed with the food, and aids digestion, partly by mechanically dissolving the food and aiding mastication, and partly by its chemical composition.

299. THE MINUTE ANATOMY of these various glands is scarcely of sufficient interest to the general observer to warrant its introduction here; but the objects and use of the various secretions are so intimately connected with their diseases, that it will be desirable to enter into some examination of the composition of bile, urine, and saliva, so that the importance of their due secretion in proper quantities may be recognised; and also that it may be known that, when they are not properly carried off from the circulation, mischief is sure to arise.

300. BILE seems greatly to resemble fat in its composition, consisting of a large proportion of carbon and hydrogen, with a small amount of oxygen and nitrogen, a very considerable quantity of sulphur, and a colouring matter which varies in different animals. The use of this fluid appears to be of a double nature, partly excrementitious or depurative of the blood, and partly for the purpose of aiding digestion. In conformity with this supposition, it is found that a part of the bile passes off with the fæces, including the colouring matter; and in a state of health, another part of a soapy nature is re-absorbed with the digested food in the shape of chyle, and appears to possess the property of saponifying, or rendering soluble, the fatty matters contained in the food, so as to fit them for the uses of the body. Tho elements of the bile are supplied by the wearing down of the tissues, especially the muscular system, and we may consider as a chief office of the liver the removal of such products as are rich in carbon and hydrogen. It may be considered certain that bile is formed in the liver, and that, although its elements exist in the blood of the portal vein, yet they are not in the shape of bile, but in a much more poisonous form, since we find that the non-secretion of this fluid is much more prejudicial to the system than its absorption from the gall-bladder or ducts, in consequence of obstructions in their mouths. It is also pretty well ascertained that the liver draws off from the blood all the carbonaceous elements of the food which are not required for the support of respiration, or are not stored up as fat; and thus we continually find the liver, when inclined to be torpid, completely overdone by any excess in this kind of food, such as rich, oily, or creamy articles, or wines or spirits, all of which are apt to produce what is called a fit of "the bile."

301. THE URINE is purely an excretion from the body, being a watery fluid holding in solution those materials, which having been employed in building up the body are worn out, and would actually be prejudicial if allowed to remain in it. The average quantity poured out in twenty-four hours is from two to three pints in those who do not drink more than nature requires under ordinary circumstances; but this amount fluctuates in a remarkable degree according to the state of the atmosphere as to temperature and dryness, and also in proportion to the quantity of fluid imbibed. Thus, in a hot and dry day, the skin throws off by perspiration a large volume of vapour, which is supplied from the same source as the water of the urine, and consequently that fluid is diminished in proportion, as far as its bulk is concerned; but, as the perspiration does not carry off much of the saline materials, the urine, though diminished in quantity, is proportionately more loaded with solid matter. Thus, even in health, the difference in the amount of solid

matter ranges from $3\frac{1}{3}$ to $6\frac{1}{2}$ per cent.; and in disease, the variation is far greater. About one-third of these solid materials is made up of alkaline and earthy salts, the remaining two-thirds being composed of organic compounds, consisting solely of carbon, hydrogen, oxygen, and nitrogen, chiefly under the form of urea and its compounds with oxygen, ammonia, &c. The salts are mainly those existing in the blood, which do not pass through the mucous membrane, skin, &c.; and the proportion of alkaline and earthy phosphates is consequently greater than in that fluid. In a state of health the urine is slightly acid; and, on the other hand, in disease the acidity is either greatly increased, or it is replaced by an alkali. Urea, and uric or lithic acid, form the chief part of the organic substances held in solution. Urea may be readily separated in the form of colourless crystals, made up of hydrogen 4, carbon 2, oxygen 2, and nitrogen 2. Its amount in the urine varies greatly in accordance with the nature of the food, and the degree of exercise taken, and with the age of the individual, children excreting full twice as much in proportion to their weight as adults; and these, again, two-thirds more than very old people. This fact is in accordance with what we know to be the wear and tear of the general tissues, which are worn out and replaced much faster in early life than in old age. Lithic acid is composed of hydrogen 4, carbon 10, oxygen 6, and nitrogen 4: it, also, may be readily crystallised, but it is so sparingly soluble in water, that it requires ten thousand times its weight to suspend it. In the urine it is held in solution, because it is united with a base, which is generally ammonia, constituting the salt called lithate of ammonia, which being very soluble in warm water, is suspended in large quantities in urine at the usual temperature of the body; but on this becoming cold, it is precipitated in the form of a cloud of fine powder, generally of a brick-dust colour, though sometimes of a pale yellow ochre. In other cases it is thrown down in the shape of small red crystals, resembling cayenne pepper in colour, and presenting the appearance which is usually recognised as gravel. There are other organic substances met with in the urine in small quantities, such as hippuric and lactic acids; but they need not here be dwelt upon, not being of sufficient interest to take up the attention of the general student of disease. With regard to the saline materials, they seem to be specially intended to form the means of carrying off the sulphur and phosphorus taken in with the food, after being united with oxygen in the blood-vessels; and so we have sulphates and phosphates in abundance—the sulphur and phosphorus having first combined with oxygen to form their respective acids, and then having united with the soda, lime, and magnesia, which had previously been held in combination by the vegetable acids in the fruits and vegetables which form a part of man's usual food. The alkaline sulphates are soluble in cold as well as in warm water, and are therefore never deposited; but this is not the case with the phosphates, which are frequently deposited as sediments of a white colour, being sometimes in the form of crystals, and, at others, in a fine powder. The crystalline deposit is known as the *triple-phosphate*, or phosphate of ammonia and magnesia, while the powder contains chiefly the phosphate of lime. When these are seen in the urine it is always alkaline, as shown by the use of test-papers; and there is reason to believe that the lining membrane of the bladder itself has the power of secreting these alkaline deposits, when it is irritated by the mechanical friction of any foreign substance, such as a stone, or any instrument retained within it. One great cause of the excessive production of phosphatic deposits is to be found in any over-stimulation of the brain, which being largely composed of phosphorus, and being worn down by any exercise of its powers, in the same manner as any other organ of the body, requires that this substance shall be combined in such a form as to be soluble, with an alkaline base; and hence, it is found in the urine in large quantities, passing off as a phosphate of lime, or magnesia, or ammonia, under all circumstances in which much mental activity is exhibited for many consecutive hours daily.

302. A competent knowledge of the above constituents of the urine is essential to the proper treatment of those diseases in which its composition is affected, and, as these are so numerous, its importance may readily be gathered. The ordinary observer must depend upon his examination of the quantity and specific gravity, the acidity or alkaline condition, and the deposits of the urine, which for his purpose are quite sufficient, especially if to these points he adds a knowledge of the presence of sugar or albumen, both of which substances are sometimes met with in disease. The healthy quantity has already been alluded to. The specific gravity is readily ascertained by the *urinometer* (which see), and in health should not vary greatly from 1.018. The acidity or alkaline condition are shown by the use of litmus-paper, which turns red if the urine is acid, and by turmuric-paper, which becomes brown if there is a free alkali present. The presence of the deposits may easily be recognised by the eye, and their respective natures have been already described. Lastly, sugar or albumen may be suspected when the specific gravity rises far above 1.020, and if it reaches 1.030, one or the other is almost sure to be present. Sugar may be recognised by the sweet taste, or by the fluid becoming sticky or syrupy, when gradually boiled down; while, on the other hand, albumen may easily be shown to exist, either by boiling some of the urine in an iron spoon over a candle or spirit lamp, or by adding a few drops of nitric acid, either of which processes throws down a flocculent or curdy precipitate, if albumen is present.

303. The Total Suspension of the urinary secretion is soon productive of a fatal result, from the retention of the elements in a poisonous amount within the blood-vessels; and it appears that death takes place from their effect upon the brain. When the secretion is only partially suspended, as, for instance, when there is a mechanical difficulty in its being carried off, the skin and bowels, to a certain extent, perform the office of the kidneys, and the perspiration is loaded with urea, so as to give a strong smell of urine. The retention of urea in the blood appears often to lead to irregular contraction of the muscles, most likely due to the action of the poison on the nerves; and hence, it appears probable that the hysterical paroxysms, in which convulsive actions of the muscles are almost invariably present, are caused by the want of proper depuration of the blood from its urea. At all events, there is generally after them an excessive action of the kidneys, the urine being sometimes loaded with lithate of ammonia, and at others almost limpid, and containing scarcely any mineral or organic substance in solution. If the former is the case, the attack is immediately relieved; while, if no urea is carried off, the quantity of urine passed without it seems to aggravate the hysterical condition, rather than to relieve it.

304. The Saliva seems to act chiefly as a *ferment* upon the food with which it is mixed, so that starch is converted into sugar by its agency, and when acidified, it exerts a considerable solvent power upon the animal substances used as food. It contains about one per cent. of solid matter, partly animal, and partly mineral, the latter consisting of the chlorides of sodium and potassium, together with the phosphates of lime, magnesia, and iron. The tartar, which collects about the teeth, is chiefly composed of these phosphates mixed with, and held together by, a small proportion of animal matter. The quantity of saliva formed in twenty-four hours is said to be about a pint, but this varies so much that the estimation can only be an approximation to the truth. The flow takes place chiefly when it is wanted, that is, during mastication, and as its use is clearly ascertained to be great in the digestion of our food, so its due admixture with it being dependent on a proper degree of mastication, that process ought to be more attended to than it is.

SECT. 2.—INFLAMMATION AND CONGESTION OF THE GLANDS.

SUB-SECT. A.—CONGESTION AND INFLAMMATION OF THE LIVER.

305. THE LIVER being, as already described, made up of a double set of blood-vessels, and having an important duty to perform in the animal economy, it may readily be supposed that it would be very liable to a disturbance in its circulation, which may be either *active* or *passive congestion*, both being common conditions of the organ, or actual inflammation may be present, which, though sometimes occurring, is by no means so usual a disease. This last has received the name of *hepatitis*. Various degrees of congestion and inflammation of the liver have been made out by morbid anatomists, and described by them, under the terms *passive* congestion, *hepatic venous* congestion, and *active* congestion, partial, as well as general; but as these are beyond the limits of the ordinary observer, they must here be passed over, although highly interesting in themselves. It may, however, be observed, that if *active* congestion occurs in the liver, it will increase the flow of bile, or if *passive*, it may retard its formation, or alter its quality in other respects; but if, instead of this condition, inflammation is set up, the consequences are much more serious, and then we have suspension of the secretion, followed by softening, or hardening, or abscess, according to the degree and nature of the inflammation.

306. ACTIVE CONGESTION of the liver is a consequence of irritation in its tissues, either owing to the retention in the blood of the materials, which ought to be carried off by the kidneys and skin, or to an excessive amount of carbonaceous material in the food, or to some local cause existing within its own substance as the result of organic disease. In either case, it leads to an excessive secretion of bile, and to the development of one extreme form of those derangements of the stomach, which are known as bilious, and in which there appears to be an excess of bile constantly passing, as shown in the evacuations.

307. PASSIVE CONGESTION of the liver is the result of mechanical impediment to the return of blood from the liver, which may be seated in the veins of the liver itself, or in the heart, which is close to the liver; or sometimes more remotely by means of the lungs impeding the flow through the heart, or, in fact, almost any impediment in the large vessels of the body; and even sedentary habits alone will have a partial effect in producing this congestion, by the pressure which is constantly made upon the vessels, in consequence of the bent position of the body. Any or all of the above causes may, therefore, be considered as likely to produce this species of congestion, in which the circulation through the liver is impeded, the quantity of blood in it increased, and, as in all cases of passive congestion, the secretion is affected in quantity and quality, without any absolute change of structure as in inflammation. What is commonly called a sluggish liver is one in this stage or condition, but only slightly affected; and here the secretion of bile is simply diminished in quantity, without being much altered in quality. In the more severe forms, however, the bile, after its secretion has been suspended for a time, is very acrid and plentiful, and its passage into the intestines is attended with a good deal of disturbance.

308. THE SYMPTOMS of congestion of the liver may be known by the state of the secretions as described, when they exist unattended by the peculiar signs of inflammation, to be presently enumerated. There is, however, generally more or less uneasiness of the right side, with a dull heavy pain in a very slight degree near the shoulder-blade.

309. ACUTE HEPATITIS, or inflammation of the liver, varies in intensity and length of duration, and in the precise situation of the disease. The most usual form is an inflammation of the substance of the liver; which may either extend to the whole organ or be confined to a part of it, the

latter being the most common. The side is fuller than usual, and there is a sense of pain in it, and a dull aching and uncomfortable feeling about the right shoulder-blade. This extent of mischief marks the simple inflammation, which may end in resolution, or it may go on to the formation of an abscess, or to what is called red softening of the liver, or to a chronic stage of inflammation, to be presently described. The *symptoms* of acute hepatitis are a pain in the right side, increased on pressure or on a deep inspiration, and aggravated on lying on the left side. There is generally some little increased quickness of breathing and cough; but these are sometimes both absent. Pain in the right shoulder is an almost invariable attendant, and there is also more or less yellowness of the eyes and of the whole skin, occasionally going on to absolute jaundice. The urine is high-coloured; fæces pale, or even clay-coloured, but sometimes coloured deeply with a greenish bile. Vomiting is a symptom which may or may not be present. This acute form of inflammation is generally the result of congestion in an inflammatory subject. It may be distinguished from pneumonia by the pain in the shoulder, by the fulness and tenderness of the right side, by the yellowness of the skin, and by the colour of the fæces and urine; also by the absence of the stethoscopic signs of that disease. The same symptoms, with the exception of the last, will also serve to distinguish it from gastritis.

310. **Chronic Hepatitis** is the form which is the most usual in this country; and it may even be said to be a very common disease. This is scarcely to be wondered at, when we consider how the liver is abused, and what an amount of unnatural work it has thrown upon it, in order to get rid of the quantity of over-stimulating food and drink which are taken into the stomach by many of those who have the means to gratify their appetites. In describing the use of the bile at par. 301, it was stated that one is to carry off the superfluous carbonaceous materials contained in the food; and so we find that, according to the extent of the superfluity, is the over-stimulation of the liver, and the frequency of that active congestion which leads on to chronic inflammation. Here, then, we have the primary cause of the mischief, resulting in the slow kind of disease which ends in the following conditions, viz.—*simple induration*, *scirrhus*, *tubercle*, *hypertrophy* and *wasting* of the liver. The disease often commences with an attack of acute hepatitis; but sometimes it is chronic from the very commencement. The chief *symptoms* are more or less derangement of the stomach and bowels, with long-continued and dull pain in the right side, increased by excitement, such as walking or riding, or even by gentle pressure with the hand; also some degree of swelling or fulness in the side, a sallow countenance, dry skin, and foul but *moist* tongue, together with high-coloured urine, and pale *fæces*. These mark a clear case of chronic hepatitis, which may be complicated with any one of the conditions of the liver mentioned above, except atrophy, in which there is no swelling, but the reverse. In less distinct cases, the local symptoms are not so well marked; but there is almost always some pain in the right shoulder, with a disagreeable sense of fulness or tightness in the right side, and disturbance in the functions of the stomach and bowels. The countenance is, after all, the best guide; and, to the experienced practitioner, it will generally serve to distinguish the disease. Besides the immediate changes produced in the liver, there are also others which are more distantly caused by the pressure which the enlarged liver makes upon the veins which supply it with blood, and which are derived from the intestines. Thus we find, after a long continuance of any enlargement from chronic inflammation of the liver, that the cavity of the peritoneum becomes filled with water, the serum of the blood having oozed through the walls of the blood-vessels distributed over its surface. This is a common cause of

ascites, or dropsy of the belly; or, sometimes *anasarca* or dropsy of the lower limbs; or it may produce *piles* from congestion of the veins derived from the lower bowel, so that they swell and are gorged with blood, which is the commencement of that painful affection. The diseases with which chronic hepatitis may be confounded, are chiefly the following, viz.—chronic gastritis, chronic pleurisy of the right side with effusion, and a neuralgic affection, which simulates it in a way to deceive all but the experienced observer of disease. The state of the biliary secretions, of the countenance, and of the skin, will be the most reliable guides; and in addition to them, hepatitis may be known from effusions into the pleura by the prominence of the intercostal spaces in that disease; and from neuralgia by the absence of tenderness and swelling, and by the comparatively healthy condition of all the secretions which attend upon this, in common with all nervous affections.

311. CONGESTION IN THE BILIARY DUCTS is apt to result in a partial or total stoppage of the flow of bile producing JAUNDICE, or a highly coloured yellow stain of the skin, which, however, may arise from other causes; but as it will be convenient to consider jaundice here as a disease by itself, the various conditions in which it may exist will be grouped together, being as follows—1st, when arising from obstruction caused by gall-stones; 2nd, from obstructions in the gall-ducts themselves; 3rd, from diseases of the duodenum at the point of entrance of the ducts; and 4th, from the pressure of contiguous tumours upon the ducts in any part of their course.

312. JAUNDICE, when produced by the obstruction of gall-stones lodged in the biliary passages, is generally sudden in its onset, and accompanied by the usual signs of their presence—namely, acute pain extending down the back and along the course of the nerves in the thighs, and sickness—gall-stones in the gall-bladder itself produce no inconvenience; and large numbers of them are often found there after death, without their existence having been suspected during life. They are usually nothing more than inspissated bile, but arranged in a somewhat crystalline form, resembling spermaceti in all but colour, which is usually a greenish-brown, or sometimes a bright yellow. When jaundice arises in this way, the accompanying pain is very acute, so much so, as to cause the perspiration to stand on the face in large drops. It generally occurs in paroxysms, and in the intervals, there are often violent shiverings, which seldom precede the attack, as in inflammation of the organ. After the pain has continued for some hours, with certain intermissions of variable length, it usually subsides, either from the gall-stone passing, or from its slipping back again into the gall-bladder, and then the jaundice usually disappears, but in the latter case, only to return again at some future period. Unless, therefore, the biliary concretion is seen in the evacuations, no reliance can be placed on its having passed the obstruction.

313. OBSTRUCTION IN THE GALL-DUCTS themselves is generally only a part of some more extensive disease, which may be either simple induration, or scirrhus, or tubercle. Here the presence or absence of pain leads to very little knowledge of the exact nature of the complaint, because it is the suddenness of the obstruction, and not its completeness, which gives rise to the acute pain which comes on in some instances. A small amount of contraction is very often found, and is sufficient to cause a corresponding impediment, which does not, however, reach the stage usually called jaundice, but only that denominated a sluggish or inactive liver.

314. WHEN THE DUODENUM is the seat of the stoppage, it is not often complete, neither is the pain so severe or so paroxysmal as in gall-stone. The disorder of the stomach is here the prominent symptom, vomiting being almost always present, and sometimes obstinately persistent. Spasm of the muscular coat will, in some cases, give intense pain, and lead to partial or very temporary jaundice; but it seldom lasts

long enough to cause that deep colour which usually is recognised as composing the essence of the disease.

315. Jaundice produced by the pressure of contiguous tumours is very gradual in its onset, and unless the swelling is of a scirrhous character, the pain is not often severe, nor is it then of the paroxysmal nature, which we see in gall-stones. Whatever leads us to suppose that such tumours exist, will, of course, confirm the idea that they are the cause of the jaundice; but, as the detection of them is very difficult, and often tries the utmost skill of the experienced practitioner, it will scarcely be possible for the ordinary observer to make out the various delicate signs which induce him to suspect their existence. His best course, in all such cases, is to seek for further advice.

Sub-sect. B.—Congestion and Inflammation of the Spleen and Pancreas.

316. The Spleen and Pancreas are liable to enlargement, apparently from congestion or inflammation; but the symptoms are so obscure, and the various descriptions of them are so contradictory, that it will be idle to attempt to give any guide to them here. Enlargement of the spleen is sometimes, however, plainly to be felt on the left side beneath the stomach, and generally after some long-continued attack of ague, or a series of them following at short intervals.

Sub-sect. C.—The Inflammatory and Congestive Diseases of the Kidneys.

317. The kidneys being made up so largely of blood-vessels, it is not surprising that their diseases should be mainly owing to congestion and inflammation, caused, in great measure, as in the case of the liver, by the excessive amount of work which they have to do in consequence of the abuse of food, and by the frequent stoppage of other organs which assist the work of depuration with them—namely, the liver and skin. These diseases are chiefly the following—viz., simple inflammation (*nephritis*), granular degeneration (*Bright's disease*), gravel and stone, bloody urine (*hœmaturia*), suppression of urine, and immoderate flow (*diabetes*), which, when the urine contains sugar, is called also *mellitus*. Beyond these, we sometimes find malignant diseases of these organs, as of all others, such as cancer, &c.; but these, being very rare, need not enter into the present subject.

318. Simple Inflammation of the kidneys may either be *acute* or *chronic*, the two variations being only marked by the more or less activity and rapidity of the *symptoms*. These are acute but deep pain in the loins, extending downwards towards the bladder and towards the groin, and frequently accompanied by pain along the inside of the thigh. This pain is sometimes dull, but it is always increased by *deep* pressure with the fingers, or by the erect posture, by coughing or sneezing, or by holding the breath forcibly while straining, as if at stool. Any stretching of the thigh on the affected side also gives pain; so that the patient generally lies with one or both legs drawn up—if one only, then that marks the affected side. Nausea and vomiting usually occur, with partial or nearly total suppression of urine, the small quantity passed being so acrid as to cause the bladder frequently to require to be emptied. Sometimes the urine is stained with blood, giving it a smoky colour, and not that of fresh blood. When this is the case, there is generally sufficient albumen in it to coagulate by heat; but it seldom lasts beyond the early stage; and after this the urine becomes pale, watery, and nearly devoid of all salts, indicating a cessation of true secretion, and a mere straining off of the watery parts of the blood from the loaded vessels. Some amount of fever generally accompanies this disease, with a full hard pulse, and at first very frequent, but soon becoming small, wiry, and slower; tongue furred; bowels confined, and usually full of wind, with spasm, and discomfort; the countenance is almost always expressive of severe constitutional disorder. When this condition

has gone on for a short time, it ends either in resolution, or in abscess, or gangrene, and if the first of these takes place, the symptoms disappear, and health is regained; if the second, violent rigors occur, and, after great pain and constitutional disturbance, death takes place, or matter is discharged generally stained with blood, together with the urine. Gangrene is attended with excessive prostration, and cessation of pain, soon followed by death. The most frequent *causes* of nephritis are violent diuretics, or large quantities of spirits, especially adulterated gin; the presence of stone in the kidneys; mechanical injury, such as falls; and, lastly, the gouty diathesis, in those who indulge freely in the pleasure of the table. It may be known from *lumbago* by the pain being confined to one side —that is, if one kidney only is affected— by its extending downwards along the thigh, and showing itself in the groin, and by the accompanying altered condition of the urine.

319. Bright's Disease, as the *granular degeneration* of the kidney is called, from the name of the physician who first drew attention to it, may also be acute or chronic, but the latter is by far the more common condition. In the *acute* form, there is one, or sometimes two or three *rigors*, with a good deal of feverish disturbance, dull pain in the loins, sometimes shooting down to the groin; nausea, and even vomiting, and in a few days, anasarca or watery swelling in the cellular membrane of the body. The urine is scanty, or nearly suppressed, sometimes bloody, but always loaded with albumen, so as to coagulate into a cake of curd on the application of heat. If this severe attack does not soon yield to appropriate treatment, it subsides into a chronic stage, or else it goes on to produce *coma* and death. The *chronic* form of Bright's disease may commence as above, or it may come on more gradually, without rigor or fever, in which case the first symptoms are—frequent desire to pass the urine, and debility, with slight and dull pains in the loins increased on pressure; the countenance looks depressed, and the complexion is pale and pasty; the urine varies greatly as to quantity, but it is generally of a deep brown muddy colour, of a high specific gravity, and coagulates by the action of heat or nitric acid, the amount of the flake indicating pretty nearly the extent of the disease; the skin is dry; stomach irritable, and appetite generally absent, or very capricious; after a time dropsy in some form shows itself, or diarrhœa, or in some cases rheumatic disease. Bright's disease consists in a more or less complete wearing away of the internal coat of the urinary tubes, which is cast off in shells or scales, coated with fibrine. There is also an increase of fat in the substance of the kidneys, which is essential to the disease, and like the similar fatty deposit in the liver, is most probably due to the excessive quantities of fat-producing food which we eat, above what nature requires. This improper diet, united with want of exercise and impure air in a bad constitution, or one recently impaired by the poison of *scarlatina*, are likely to lead, at any age, to the production of this intractable disease.

320. Gravel and Stone are only two different conditions of the same disease, the former being little stones, while the latter may be said to be gravel, enlarged by subsequent deposits from the urine of similar materials in coats. Whenever the urine holds in solution more than a certain quantity of saline and organic matters, it has a tendency to deposit them in a crystalline shape, while the *urine is still warm*—that is, within the body. We all know by our daily experience, either in our own case, or that of some relation or friend, that the urine in cooling often deposits clouds of fine dust, or in some cases small crystals in the chamber vessel. This arises from the fact that warm urine holds more salts in solution than cold, and, consequently as the animal heat departs in cooling, the difference between the quantity held by cold water and that dissolved by warm is thrown down. But in the living body—though we know by experience that such deposits take place, yet we can not so clearly make out

why the urine should first hold these substances in solution, and then after a very short interval refuse to do so any longer, the consequence being the formation of gravel. When once a speck of gravel, however small, has been formed there is no longer any difficulty in understanding how it becomes increased in size so as to constitute a stone; because we know from the analogy of all solutions liable to crystallize, that they hold their materials suspended much longer when there is no angular substance presented to them, than they do in case of such being within their reach. Hence, in making sugar-candy, strings are drawn across the syrup, upon which the sugar is deposited; and so we find, if by chance a piece of metal of any kind reaches the bladder, it is soon encrusted with the predominating salt, whatever that may be, and forms the centre of a stone. The usual course, therefore, is that from some unknown cause a particle or particles of gravel are deposited in the kidneys; and that these either pass on to, or through, the bladder in the shape of gravel, or they remain in the kidney, to be enlarged by the addition of new coats of the same substance, or of other material from the urine, and constitute what is called stone in the kidneys (*nephritic calculus*); or lastly, having reached the bladder, either as small stones or large specks of gravel, they are there detained and enlarged by a similar addition of new coats until they present the appearance which is known as stone in the bladder (*cystic calculus*), and are often (or used to be so) some ounces in weight. A description of the appearance and composition of these stones will be found under the head of *Stone*. (par. 324.)

321. THE SYMPTOMS of gravel are a pain in the loins, which may be acute or dull, with a sense of heaviness in that region. More or less difficulty in voiding the urine, which in some cases of gravel is great, when a large piece occupies the passage from the bladder (*urethra*). In such a case, there is considerable irritation of the neck of the bladder, and itching at the end of the passage, whichever the sex may be. The urine as soon as passed is generally cloudy, or shows small crystals at the bottom. It is invariably scanty and high-coloured, of a high specific gravity, and strong odour. The digestive organs are out of order, and there is usually with this a sense of uneasiness at the pit of the stomach with flatulence. Constipation, also, is a frequent accompaniment of the disease; but sometimes obstinate diarrhœa prevails, and aggravates the mischief by carrying off the watery particles which would otherwise dilute the urine. The skin is generally in that case dry, and there is always more or less feverishness and restlessness at night. The *cause* of gravel is almost always dyspepsia, and too great a proportion of food for the work done by the body. Sometimes, however, it arises from organic disease of the kidney or bladder, for which no reason can be given.

322. The most common form of gravel is lithate of ammonia, which presents a fine reddish-brown or yellowish powder, more or less mixed with lithic acid crystals, which are of a brighter red, and resemble cayenne pepper in colour and general appearance, except in weight, they being heavy and of a stony hardness. These last are commonly known as *red gravel*, while the phosphatic deposits, either of lime or of ammonia and magnesia mixed, are known as *white gravel*. There are other kinds of gravel, but too rare to require description here.

323. THE SYMPTOMS OF STONE IN THE KIDNEY are those of gravel, but in an aggravated form, together with inflammation of the organ, which is generally caused by its presence. These persist until the stone passes on into the bladder; and when they are clearly present, the attention should be directed to ascertain that the stone has actually left the latter organ, or it will remain there in it increasing in size, until it becomes painfully clear that it cannot pass or remain quiet in its new situation. Sometimes a stone in passing from the kidney to the bladder lodges in the tube which leads from the one

to the other, and the symptoms are then said to be those of *stone in the ureter*. They are—a deep pain between the bladder and kidneys, extending to the groin and down the thigh; a constant desire to pass water, nausea, and vomiting, with fever, restlessness, and great anxiety of countenance. Sometimes this state continues for several days; but usually it passes off in a few hours, the stone having reached the bladder, and then no irritation is felt for some little time.

324. STONE IN THE BLADDER may exist for some weeks or even months, or years, without much uneasiness, especially if small and smooth. After a time, however, as the stone enlarges, it produces an occasional sudden stoppage in the flow of the urine, from mechanical impediment in consequence of its coming over the orifice of the urethra, and this goes off just as suddenly from the slightest change of position, or sometimes from the spasmodic efforts of the bladder to relieve itself. With this there is also generally an irritable and painful condition of the neck of the bladder, causing frequent desire to pass the urine. There is also pain at the end of the penis, which is apt to be drawn out by the patient in his efforts to relieve himself, and especially if he is of childish years. When these symptoms exist, no time should be lost in obtaining the opinion of a surgeon, who will sound the bladder—that is, he will pass a metal instrument, called a sound, into it, without much pain or inconvenience; and if there is a stone there, and he is possessed of sufficient skill, it will show its presence by striking against the instrument, as it is moved about in the bladder, with a view to the detection of the stone. Practice is essential to the success of this operation, and none but an educated surgeon ought to attempt it.

325. The COMPOSITION and origin of stones in the bladder vary a good deal. They may arise either from the salts of the urine, or from the mucous membrane of the bladder, which has the power of depositing a phosphate of lime upon any foreign body which irritates it. They vary in weight from a few grains to forty-four ounces, which is the largest ever known to exist. As many as 142 have also been extracted from one bladder. The largest ever extracted entire weighed sixteen ounces, and was removed by Sir A. Cooper with a fatal result. Mr. Mayo, of Winchester, removed one fourteen and a-half ounces in weight, but not entire, and the patient lived many years after. The *lithic acid calculi* are the most common, and they are oval, flattened, and smooth. *Phosphate of lime* is not very common, as the material of which stone is composed, it is yellowish-white in colour and rough. The *triple phosphate* of ammonia and magnesia forms a white or pale grey stone, composed of small and brilliant crystals. The *phosphate of lime* and *triple phosphate* mixed, form what is called the fusible calculus, which resembles hardened mortar; and, lastly, the mulberry calculus is composed of *oxalate of lime*, and receives its name from its rough surface, resembling that of a mulberry. Many stones, however, are composed of alternate layers of the above various kinds.

326. BLOODY URINE is not a distinct disease of itself, but rather a symptom common to several others. Thus, it occurs in simple inflammation of the kidney, or in Bright's disease, or from the irritation of a stone in the kidneys or bladder, from fungoid growths, or from external violence. Bloody urine may be of a bright red colour, or it may present a dark coffee colour, or even that of smoky water, tinged also with yellow, or there may be a general body of water slightly tinged with red, and having strings or clots of blood floating in it. The source from which the blood flows may be known from the symptoms, but chiefly by the appearance of the blood, which is bright and clotted in large or small lumps, when it arises from the interior of the bladder, or its appendages; while, if given off from the kidney, the colour is evenly diffused through the fluid, and is either dark brown, or that colour more or less mixed with a smoky tinge. In the last case, there are also seen under the microscope

casts of the urinary tubes, which are the chief and most certain proofs of the mischief being in the kidney and not in the bladder.

327. By Suppression of Urine is meant the non-secretion of it by the kidneys; the term RETENTION being used for the case in which urine is formed by them in the ordinary quantity, but not passed *from* the bladder. A third disease is chiefly confined to children, and those adults who are afflicted by some mechanical defect, or are in the last stage of some highly dangerous disease. This is termed INCONTINENCE of urine, and consists in a want of power to retain it, which may be either constant, or only during sleep.

328. Suppression of urine, if complete, is always a most dangerous symptom of disease of the kidneys, or it is the effect of some poison or medicine administered in an over-dose. It is accompanied by great restlessness, with a sense of weight in the loins, frequent pulse, nausea or sickness, severe headache, flushed face, and hot skin, with other symptoms of fever, according to the *cause*, which, if sudden, will establish it in high activity. Total suppression seldom lasts beyond three or four days without a fatal termination; the poisonous effect of the urea retained in the blood being to produce coma or convulsions and death. It may readily be distinguished from retention by the empty state of the bladder, when examined by the hand placed on the lower part of the abdomen, or by the catheter used by the surgeon.

329. Retention of urine may be due either to the loss of power in the bladder to expel its contents, or to some stoppage in the passage by which they are carried off. *Paralysis* may occur under many circumstances, such as injury of the brain or spinal marrow, or any disease affecting those organs, such as typhus fever, or it may be the result of over-distention of the organ. When it occurs, as soon as the bladder is filled to such a point as to act by its elasticity and not by its muscular coat, the urine dribbles away, and some slight relief is afforded, but only enough to prevent its rupture. *Stoppage in the passage* is caused either by spasm of the muscles of the neck of the bladder, or by enlargement of a gland situated around it, and called *the prostate gland*; or by a temporary or permanent contraction of some other part of the passage (urethra) which is called in either case a stricture. *Enlarged prostate* seldom occurs before the age of 45 or 50, after which it is the most common cause of retention. It generally commences with a slowness and difficulty of making water, and a sense of weight. After some time the bladder becomes irritable, and the water cannot be held nearly as long as usual. It is now found impossible to empty the bladder completely, owing to the gland enlarging in such a way as to act like an imperfect valve. The consequence is, that the retained urine is decomposed, evolving ammonia, and thereby irritating the organ still more, as well as offending the nose when passed. These symptoms gradually become worse and worse, until the bladder cannot be relieved at all without the aid of the catheter, and at last the disease extends to the kidneys, though sometimes by proper attention a good old age is attained without this complication; and the mischief is confined to the mechanical difficulty experienced in relieving the bladder. *Stricture* of the urethra may either come on gradually, or its attack may be sudden, and without any warning whatever. In the former case the urine is passed with a twist, which gives the stream a cork-screw appearance, and it is also considerably diminished in size. The bladder cannot be emptied without stopping, and some little difficulty is experienced in getting rid of the last few drops. These symptoms go on, accompanied by irritability of the bladder, so that the water is only retained for a very short time; and during the night the rest is disturbed by the frequent necessity for rising from the bed. Sometimes this state leads to spasmodic stricture, and at others, to inflammation and abscess;

but unless these occur the retention is seldom complete, the stream, though small, being sufficient, *in time*, to relieve the bladder. *Spasmodic stricture* generally attacks persons who are affected with more or less permanent stricture, as above described, or who have some inflammatory condition of the passage from some other cause. Its first symptom is a *sudden* stoppage in passing the urine, a few drops only being voided; and then, in spite of all the efforts made, which are sometimes extremely violent and painful, not a drop more can be squeezed out. The bladder soon becomes painfully distended; the fear of the result adding to the quickness with which the kidneys secrete their fluid, as is the usual effect of this mental emotion. The straining now increases to a most frightful degree; and, in general, some few drops are passed, but without relief, the secretion being more than sufficient to counterbalance them. The perspiration soon smells strongly of urine, and is sometimes increased in quantity, so as to afford a trifling amount of relief; but if the bladder is not emptied either by the natural passage, or by the use of the catheter, its coats burst into the cavity of the abdomen (the peritoneum), and death inevitably takes place. Three or four days are the most which can be passed, from the time when the bladder becomes full; and less than this time will often suffice to effect irreparable mischief. Sometimes the rupture takes place through the passage just behind the stricture, and then the urine passes into the cellular membrane of the *perinæum*, and causes severe inflammation, accompanied by its usual results—viz., the formation of matter or gangrene. All these conditions are of so critical a nature as to be unfit for the management of any one but the experienced surgeon. *Incontinence of urine* during the night is very common among children, and is mainly owing to weakness, or in some cases to a want of management on the part of the nurse. The *dribbling of urine*, which is generally mistaken for incontinence, is often really a symptom of retention from paralysis, as already described, and is not, therefore, properly classed as incontinence, in which the bladder is empty, or nearly so. Sometimes, however, after an operation in the male sex, or subsequently to a tedious childbirth in the female, there is some mechanical defect, which causes the urine to be passed as fast as it is secreted. These, however, are not common cases; and if they occur, their cause is always known to the attendant surgeon.

SUB-SECT. D.—INFLAMMATION OF THE SALIVARY GLANDS, TONSILS, &c.

330. THE PAROTID GLAND is liable to two forms of inflammation, one of which is very common, and receives the name of *mumps*, the other being a *simple inflammation* of the gland. In the latter case there is more or less swelling, pain, and the usual symptoms of inflammation, chiefly confined to the space behind the jaw and beneath the ear, but extending somewhat also towards the cheek. The skin after a time becomes inflamed, and generally the other salivary glands (the submaxillary and sublingual) are also affected, *but not at the same time*. Unless there is a decidedly scrofulous condition of the system, the inflammation goes on pretty rapidly to form a healthy abscess, or to end in resolution; but, if scrofula exists, it may be very tedious in its progress, and last for months or years, in which case the description properly falls under that of scrofula itself. MUMPS is that species of inflammation of the parotid gland which occurs epidemically, or as the result of contagion; and it is called in Scotland *branks*. It commences with the same local symptoms as in simple inflammation of the parotid, and the swelling soon extends to the submaxillary gland, and to a considerable part of the throat. Sometimes one side only is affected, but generally both are swollen together. There is a good deal of fever, but not of a very high character in point of intensity, and this lasts about three or four days,

when it begins to subside, together with the swelling; and, by the end of three or more days, both have entirely disappeared. Suppuration rarely takes place in mumps, nor is there often any chronic enlargement left behind. Sometimes, as the swelling goes off, the breasts of the female, or the testicles of the male, swell and inflame; but this seldom goes far enough to require any interference, and will, in most cases, entirely subside in a few days. It is a disease of early life, though adults are not exempt from it; and it seldom occurs twice in the same individual. There is little or no danger in it, except when it is repressed by cold applications, by which its fury may be expended upon the brain by *metastasis*, as this change is very learnedly called, though without any increase of our knowledge on the subject (see *Metastasis*).

331. THE TONSILS consist of a cluster of follicles on each side of the throat; and they are not, therefore, exactly of the nature of ordinary glands. They are very subject to inflammation, which goes on to produce ulceration (commonly called *ulcerated sore-throat*), or to abscess (quinsy), or to enlargement and thickening (hypertrophy). ACUTE INFLAMMATION OF THE TONSILS is very common in moist weather, succeeding a long and dry summer, and is ushered in by a sensation of dryness and heat in the throat, together with a burning pain, greatly increased on swallowing. The usual secretion at the back of the throat is at first checked; but afterwards it becomes more *plentiful*, and is tenacious and viscid. The inflammation generally extends to the palate, but sometimes it is almost confined to the tonsils. If both of them are much swollen, swallowing becomes very difficult and painful, and the breathing also is interfered with, the space between them and the base of the tongue being narrowed to a very small aperture. In extreme cases, the fluid attempted to be swallowed is returned by the nose. On examining the interior of the mouth, which can only be partially seen, owing to the difficulty experienced in opening the jaws, the whole of the palate is seen to be red and inflamed; but the tonsils themselves are swollen to a great size, and are red and glistening like wet cherries. Sometimes pus is formed within them, which may be known by the pain becoming very severe, but not so acute, and by a sensation of throbbing, which usually accompanies the formation of matter. As the abscess thus produced (quinsy) increases in size, speaking and swallowing are often both impossible, nor can the eye always reach the interior of the throat, owing to the impossibility of opening the jaws and putting out the tongue. Generally, however, the finger may be inserted between the teeth, and this readily detects the soft fluctuating feel of matter, which requires to be let out, when the swelling is very great, or else suffocation may be produced, either before it bursts, or by the great out-pouring of matter at the moment of bursting, and when possibly no help is near. The danger chiefly arises from the mild and bland nature of pus, which is consequently admitted into the trachea through the larynx, and thus sometimes occasions suffocation, when a more irritating fluid would be excluded. When, instead of the matter forming thus deeply within the tonsils, a destruction of the surface has taken place, constituting one form of what is called an *ulcerated sore-throat*, there is a deep and foul ulcer in one or both tonsils, which is very offensive in smell, and discharges a great quantity of unhealthy and bloody matter. This, however, is a very rare disease, but the chronic enlargement known as *hypertrophy of the tonsils* is common enough. It generally follows upon repeated attacks of the acute disease, but sometimes occurs without any such precursor, and is only noticed from the child being said to "speak through its nose," though the opposite condition is really the true state of the case. Sometimes the tonsils are so hard and enlarged as to feel like masses of gristle; and if the attempt is made to cut them, it is only a very sharp knife which will penetrate their substance. It is a troublesome disease, and when

existing to any great extent, nothing but removal will afford substantial relief. The alteration of voice is most disagreeable, and in addition there is always more or less tendency to inflammation, so that the child is constantly suffering from pain on swallowing, and is also quite unable to use the voice, beyond the ordinary tone of conversation, or to sing with any effect.

332. INFLAMMATION OF THE THYROID BODY, or gland, followed by hypertrophy, is called *bronchocele*, or *goitre*. In this country, the disease has also been called "Derbyshire neck," from its frequency in that county, or sometimes "a wen;" but generally, even among unprofessional people, the term *bronchocele* is now understood, or the foreign name *goitre*. In the healthy condition, the thyroid body is scarcely to be felt, lying on each side of the windpipe, and beneath a layer of muscles; but in many females it is naturally so full as to give a prominence to the part, and it may continue so for the whole of life, without going on to a greater degree of enlargement. Such necks are, however, to be watched, as on the slightest appearance of further enlargement, they should be kept down by appropriate measures. Bronchocele comes on most insidiously, often taking many years to attain such a size as to alarm the patient or her friends, being very much more common among the female sex than among men, especially in this country, where a bronchocele in a man is almost unknown—certainly not more than one or two per cent. The swelling is usually soft and flabby to the touch, and is generally free from pain, and the skin over it devoid of any change of colour, so that there is no likelihood of mistaking its nature. At first the swelling is very slight, but after a time it breaks out into a bold tumour, and gradually hangs down over the root of the neck when it attains a full size. Both sides are seldom exactly alike, one being generally more pointed and prominent than the other; and there is also generally some variation in the hardness on the two sides. When of a very large size, it is a frightful looking mass; but the average dimensions do not exceed those of an orange on each side, flattened out and joined together. The smaller tumours do not lead to any unpleasant symptoms; but when a bronchocele reaches a very large size, and especially if the connecting band is much enlarged, or if, as is sometimes the case, there is a second bond of connection behind the trachea, the respiration is very much impeded, and a constant noise is sometimes made in breathing. When this impediment exists, there is generally also headache, flushing of the face, and other signs of obstructed circulation, the result of the mechanical impediment to the breathing, and also as a matter of course, to the flow of blood through the vessels of the neck. The *cause* of this disease is not known, some supposing that it arises from the snow-water of mountainous countries, others from defective food, and others, again, from too great a quantity of lime in the water; but as it is not uniformly found that either of these causes exists in common with it, it remains to this day one of the mysteries of nature, which we have not been able to unravel.

SUB-SECT. E.—INFLAMMATION AND CONGESTION OF THE ABSORBENTS AND THEIR GLANDS.

333. In order to understand the nature of the inflammatory conditions of these organs, their healthy structure must, to a certain extent, be understood; and they will be found described under the article *absorbents*, in the 3rd Part. They may, however, be alluded to here as consisting of a set of very delicate vessels, which have the property of taking up or absorbing certain fluids and conveying them into the large veins. On certain parts of their course they pass through small glands, the use of which is not very clearly made out, and if removed, the progress of absorption does not seem to be materially impeded. One class of the absorbents is employed in removing the worn-out materials of the body, and these are the *general lymphatics*, while another set, *the lacteals*, are solely distributed over the small intestines,

from the internal surface of which they arise; and after passing through a set of glands (*the mesenteric)* they terminate in one large vessel (the thoracic duct) which enters the junction of two large veins, as they are descending to the heart from the neck and arm. Thus it may readily be understood that there is a material difference between disease of the ordinary lymphatic glands of the body and that of the mesenteric glands; because the latter, when they are affected, interfere with the passage of the chyle, and thus impede the due nutrition of the body. We may, therefore, consider these inflammatory diseases under the heads of the general absorbent glands, the mesenteric glands, and the general absorbents or lymphatics.

334. Inflammation of the General Absorbent Glands seldom extends to many of them at one time, unless there is scrofula present, when the disease is said to be scrofula itself, and will be found described under that head. Very often, however, one or two will swell and become very painful; and this is generally due to some ulcer or sore existing on the side further from the heart than they are. Thus, an inflamed and painful corn or chilblain will often produce an inflammation of the gland in the groin; or an eruption behind the ears or on the head will lead to an inflammation of one or more of the chain of glands which lie on each side the neck (called *glandulæ concatinatæ*). Sometimes a slight cold will cause certain glands to inflame, especially those which are exposed to the influence of cold draughts of air, such as the upper glands of this chain; and hence, it is often said that "the kernels of the ear are come down," when this is the case; though the fact is, that there is no change of place, but the gland previously soft and incapable of being discovered by the finger, becomes hard and painful, and is then brought to the notice of the patient, or its mother, or nurse. If the inflammation of these glands runs very high, matter is formed in them, and an abscess is the result, which in the neck should always be early attended to, as the scar resulting is very apt to lead to the idea that scrofula has existed, when a single gland only has inflamed, owing to the irritation of a decayed tooth, or an eruption about the head, or any other cause wholly unconnected with the above much dreaded disease.

335. Inflammation of the Mesenteric glands is, as far as we know, of a chronic character, and is always a sign of scrofula, appearing to be only one particular form of that disease. It is, therefore, better to consider it at the same time with its other manifestations. (See *Scrofula.*)

336. Inflammation of the Absorbent Vessels is the result of some poisonous or very acrid matter being submitted to the absorbents, or of some simple injury to them in a person out of health. The inflammation generally begins in the lymphatic vessels leading from the seat of the mischief to the nearest gland; and these appear like red lines on the skin, and are very painful to the touch, as well as giving a burning sensation to the patient. This seldom extends beyond the first absorbent gland, but that inflames at once, and may go on to form matter, or sometimes, in very virulent cases of the absorption of poisonous matter, it is conveyed into the blood, and produces constitutional disturbance of such an extent, as to put an end to life in a few days. Hence, when these red lines show themselves, it becomes necessary to take prompt measures for the relief of the mischief, and surgical aid should as soon as possible be called in.

CHAP. XVI.

INFLAMMATION AND CONGESTION OF THE BRAIN AND NERVES.

SECT. 1.—STRUCTURE OF THE BRAIN AND NERVES.

337. THE NERVOUS SYSTEM is that part through which the mind operates upon the body, and the body upon the mind. How this is effected we have never been able to ascertain; but that it is so is proved by direct experiment, for, in proportion to the removal or injury of certain parts of the nervous centres, are we able to impair or destroy the power of communicating sensation and volition. The existence of nervous matter is confined to the animal kingdom, and its presence forms one of the chief features by which it is distinguished from the vegetable and the mineral. In the largest portion of the animal kingdom the nervous matter is arranged in a distinct form complete in itself, though connected with the other textures of the body. In some, however, comprehending the lowest forms of animal life, the existence of nervous matter is not capable of being proved by demonstration; but it is supposed to be diffused through these bodies in common with the muscular fibres, so that the one may at once react upon the other. The form in which nervous matter first shows itself distinctly as we ascend the scale of animated nature, is in that of threads or cords, and consisting of white matter only, together with minute blood-vessels and connecting membrane. As we ascend higher in the scale, we find a grey matter added, generally in small masses, and at intervals, and between these masses the white cords are stretched apparently as a means of communication. Here then, we have the type of the more complicated nervous system of man, and the higher animals, in which still we find only masses of grey matter of various sizes and forms, and between them a series of white fibres, which may be either bonds of union between the various masses of grey matter among themselves, or between these last and the various parts of the body, when they receive the name of *nerves*. From the result of experiment, and also from analogical reasoning, the conclusion has been arrived at, that of these two grand divisions of the nervous system, viz.—the grey and the white, the former originates the power residing in the whole, whatever it may be, while the latter is the medium of communication. This is so thoroughly proved, that it is now received as an undoubted fact by all modern physiologists.

338. THE CHEMICAL COMPOSITION of nervous matter appears to vary greatly in different animals, and in man at various ages, and according to his bodily and mental health. One remarkable peculiarity in this substance is the large quantity of phosphorus contained in it, and the amount seems to be in proportion to the activity of the mental manifestations, which are greatest at the adult period of life. The following analysis will show the comparative weights of the various elements of the healthy human brain at the different periods of life contrasted with that of the idiot:—

	Infants.	Youth.	Adults.	Old Men.	Idiots.
Albumen	7.00	10.20	9.40	8.65	8.40
Cerebral Fat	3.45	5.30	6.10	4.32	5.00
Phosphorus..	0.80	1.65	1.80	1.00	0.85
Osmazome and Salts	5.96	8.59	10.19	12.18	14.82
Water	82.79	74.26	72.51	73.85	70.53
	100.00	100.00	100.00	100.00	100.00

From this table, it appears that the smallest quantity of phosphorus exists in infancy, old age, and idiotcy, while the largest quantity of water is found in the brain of the infant, next to whom comes the youth, and then the old man. This superabundance of water in the infant's brain affords some explanation of the frequency of effusion at that age, as in hydrocephalus.

339. THE ACTIONS of the nervous system may be either dependent on, or independent of, the mind, or in common language, voluntary or involuntary. Thus, there are certain muscular contractions which are the result of nervous communications sent by a mandate of the will. These are called voluntary actions, and the nerves through which the mandates are transmited, nerves of volition. Again, there are other muscular contractions, which depend upon nervous energy unconnected with the will, and these muscles are called involuntary; such as the group of muscles composing the heart, the muscles of the stomach, &c. Again, *sensation* or *feeling* is due to the communication between the part where it resides and the brain being kept up by certain other nerves, which are called those of *sensation*. This varies greatly in degree, from the excessive fineness and delicacy of touch enjoyed by the human finger, to the dull and almost insensible perception of contact which is communicated when a bare bone is gently touched, or even scraped. There are also special kinds of sensibility enjoyed by the various organs of sense—as sight, hearing, smelling, touch, and taste—all of which are peculiar to themselves, and incapable of acting for each other, so that it would be impossible for the eye to hear, or for tho tongue to smell. Of the involuntary contractions dependent upon nervous influence, it is difficult to afford any satisfactory explanation, further than by affording examples which may illustrate them, and, indeed, this is the extent of our knowledge on most subjects connected with the nervous system. Thus, for instance, when we expose the naked eye to a strong light, the pupil instantly contracts without any effort of the will, and without any consciousness of such contraction on the part of the individual. A large number of the movements in the living body are due to similar stimuli applied to some surface supplied with nerves. Thus, in swallowing, the food is applied to the back of the throat by a voluntary effort of the muscles of the tongue and palate; but, once there, it is beyond our control, and its further progress is due to the stimulus which it gives to the nerves of the mucous surface lining the top of the gullet. This stimulus immediately is conveyed to the bottom of the brain (*medulla oblongata*), and produces some change there, which is immediately notified by certain other nerves to the muscles which contract the top of the gullet (*the pharyngeal*), and these drive the food on. This action, although circuitous, is so rapid as to be to all intents and purposes immediate, and the two are perfectly continuous. Dr. Marshall Hall, who has investigated the subject with great care, calls these two nervous actions *incidental* and *reflex*, and shows that in many cases the second may take place without any circuit through the brain, but only requiring the spinal marrow. Thus it is shown, that after the division of the spinal marrow in cold-blooded animals, or after an accident to the spine has taken place in man, if the nerves of the legs are stimulated at their extremities, the muscles of the legs will contract. This action independent of the brain he calls the *reflex action*.

340. THE NERVOUS SYSTEM in man consists of,—1st, a series of central masses of grey matter connected together by cords or fibres of white matter; and, 2nd, of nerves or cords, which connect these parts with the rest of the body. The nervous centres are known as *the brain*, *the spinal cord*, and the various ganglions forming what is called *the sympathetic nerve*. The brain with its communicating links, together with the spinal cord, and the nerves which connect them with the body, are called the cerebro-

spinal division of the nervous system, while the remaining nerves and ganglions, with their connecting cords and their branches ramifying upon the various internal viscera and blood-vessels, are denominated the ganglionic system, or the great sympathetic nerve.

341. EACH NERVOUS CENTRE thus composed of grey and white nervous matter, and having nerves connected with it, so that its action, whatever it may be, is in close relation with the parts to which it is attached by them, has certain duties to perform, varying according to circumstances. The spinal cord and the brain are peculiar to the vertebrated animals, and may each be considered as composed of various nervous centres or ganglions, united together by white fibres, which are called by anatomists *commissures*. In the case of the brain this is easily seen, for the different portions are very distinct, and from a very early period they have received separate names; though the several uses to which they are applied were not then known, nor are they now with anything like the certainty of proof with which the other organs of the body are investigated and understood. The whole celebro-spinal system, moreover, is made up of two symmetrical halves, each resembling the other very closely in most of its details, though not to such an extent as to make one a complete *fac simile* of the other. The brain, again, besides being divided into two lateral halves, is also divided into a greater and a lesser portion (*cerebrum* and *cerebellum*), the former lying above and before the latter, and being chiefly connected with the mental manifestations. These two portions, together with their commissures and their prolongations downwards towards the spinal cord, are contained within the cranium or skull, and are largely supplied with blood by means of four arteries—the two carotids and the two vertebral arteries; so that, while they are well nourished with these primary essentials to active power, they are, at the same time, exceedingly prone to congestion and inflammation.

342. THE GREY NERVOUS MATTER is remarkable for its simplicity of structure, as far as anatomical examination has yet been able to discover. It consists of vesicles or cells, containing a soft and finely granular substance, which composes the principal mass, and their grey colour is mainly dependent upon their granular form. This tissue, which plays the important part in the body of originating all nervous action, is thus as simple in its structure, *as far as we know*, as the lowest form of animal or vegetable textures; but though we have not been able to ascertain any greater complexity, it does not follow that there is none, and we may possibly some day be surprised to find, that here, as in some other cases, the excessive simplicity of the mechanism is exactly in proportion to its power. On the other hand, the white matter, both of the commissures and nerves, is composed of tubes containing a certain pulpy matter within them, the only difference being, that in the nerves they are bound together by areolar tissue, while, in the nervous centres, they are disposed in bundles, running in different directions, and lying in various planes, and bound together chiefly by the blood-vessels which ramify among them. These white fibres, as they exist in the nervous centres, may be distinguished according to their office into four sets—two of which are continuations of the nerves, and are either engaged in conveying power to the exterior, or in receiving intelligence from it; a third set connects the various masses of grey matter together, and their fibres are called commissural; while a fourth are supposed to be connected with the manifestations of the mind, though the office of these last is purely conjectional.

343. THE SPINAL CORD is the part of the nervous system most essential to life; for we find infants born without brains, but never without this portion of nervous matter. So also during sleep the action of the brain is suspended; and the animal functions of respiration, circulation, and digestion are left under the control of the spinal cord and the sympathetic system of nerves. Formerly the spinal cord was

considered to be merely a bundle of nerves; but it is now clearly made out to be as completely a centre of nervous power as the brain itself, and the one may, just as readily as the other, be considered a continuation or addition. It is now ascertained, by direct experiment, that the nerves connected with the spinal cord receive impressions from the surface, and return certain mandates to the same part, without reaching the brain; and there is reason to believe that many irregular actions of this kind, which have been already described as *reflex*, are due solely to disturbance of the spinal cord. Indeed there is good ground for the supposition, that all convulsive diseases, including hysteria, common convulsions, tetanus, epilepsy, &c., are connected solely with a disordered condition of the spinal cord, and have nothing to do with the brain itself. These facts are of importance in reference to the treatment of the above mentioned diseases.

344. THE MEDULLA OBLONGATA is a prolongation of the spinal cord upwards towards the brain, and it does not differ in any essential particular from the former; though in the arrangement of its parts, there is this peculiarity, that it contains, *in addition*, the grey matter, from which originates the power which regulates the function of respiration and the ingestion of our food. If, therefore, the spinal column is injured below this part, respiration goes on as usual, while all the limbs are perfectly paralysed; and by this fact, it is explained that a man may break his neck, and yet be enabled to breathe and continue his existence as a mere machine for a short period of time.

345. THE FUNCTIONS OF THE BRAIN appear to consist in the development of the intellect, and in the exercise of the will, as well as in the reception of the sensitive impressions from the various organs through their respective nerves. These several functions appear to reside in different parts of the brain, the grey matter on the surface of the external convolutions being the source of the intellectual operations, while the parts, called the *corpora striata*, and situated in the centre, are most probably concerned in the voluntary movements; and the *optic thalami*, as well as the *crura cerebri*, which are parts of the base of the brain, are more immediately employed in the reception of the sensitive impressions. The mental emotions are supposed to reside in the grey matter of the upper and back part of the surface of the brain; and, lastly, the regulation of our locomotive actions is generally considered to be implanted in the *cerebellum*.

346. THESE SEVERAL ORGANS are contained within a bony cavity, which is partly made up of the cranium, and partly of the various bones of the spine, which, when united together, form one continuous hollow space. Within this they lie securely, and they are protected from injury by a dense fibrous membrane, which lines the bones, called the *dura mater*. Indeed, this not only lines the skull, but it also divides it into several large cells, so that the brain is as it were enclosed in three smaller packing-cases, instead of one large one; and the divisions also being slightly elastic, a still greater provision is made against injury from falls and other accidents of a similar tendency. Within its layers also, the veins, containing the blood returning from performing its duties in the brain, are carefully secured from undue pressure, and that in a most beautiful manner—the fibres being strained across so as to give a triangular section to the canal. Within this fibrous membrane, and closely investing the brain is another of a totally different character, being made up entirely of blood-vessels and cellular tissues to connect them. This is called the *pia mater*; and, lastly, covering the one and lining the other, is a third membrane of a serous nature, called the *arachnoid membrane*, the exact nature and use of which is a subject of dispute to the present day. In a state of health, there is always within the cranium a small quantity of fluid, which is now supposed to be secreted by the vessels of the pia mater, and which in some diseases of

the brain is increased to a great extent. This fluid appears to act as a safety-valve upon the delicate mass of the brain, preventing any sudden pressure upon it, in consequence of the inordinate action of the heart and arteries, and allowing it as it were to float on a "water-bed."

347. Independently of its bearing upon the other functions of the body, the brain and spinal cord may, therefore, be considered as a vast secreting apparatus, the healthy condition of which is essential to the due performance of the general functions, and even to the continuance of life itself. Like all the other secreting organs which are classed as glands, the nervous centres are largely supplied with blood, and their delicacy of structure is such, that if this is not properly purified by the action of the lungs, liver, and kidneys, there is an interference with the healthy performance of their duties, and a sensation of pain or discomfort in the head proportionate to the degree of the impurity. The same necessity probably exists in other glands, for the proper supply of pure blood; but there is not such an immediate bad result from the reverse, as in the case of the brain and spinal cord, nor is the circulation of impure blood in them immediately fatal. With these facts before us, then, we may now proceed to consider the diseased conditions to which the nervous centres are subject.

SECT. 2.—INFLAMMATORY AND CONGESTIVE DISEASES OF THE BRAIN.

348. THE VARIOUS DISEASED CONDITIONS OF THE BRAIN are due to more opposite causes than those of any other organ of the body, the reason being that it is more delicate in its structure, and more important to life, from its functions being to superintend all the other actions going on in the body; and being enclosed within an unyielding bony case, it is more liable to suffer from pressure, while at the same time it is more affected by it. Hence, it follows that many changes going on within the skull, which would elsewhere be unimportant, are here attended with the most dangerous, and often fatal, symptoms; as, for instance, if a small *spicula* of bone is driven or grows inwards from its walls, it would be followed by convulsions, coma, and death; whereas, if the same amount of mischief took place in the interior of the chest, and even the lungs were wounded, the consequence would be inflammation only, or perhaps a diffusion of air through the cellular membrane, known as *emphysema*, but neither of them necessarily fatal. So, likewise, if a blood-vessel gives way in the lungs, the blood poured out is capable of being expectorated; and though the mischief is of a dangerous character, yet it is not at all to be compared with what takes place in a similar rupture within the skull. Here such an accident, if extensive (called *sanguineous apoplexy*), is rapidly followed by death; or, if slight, the symptoms are alarming, and require the greatest possible promptitude in dealing with them. In fact, whether there is simply a congestion or inflammation of the brain, or the disease has gone so far as to allow of the ordinary results, namely, effusion of blood, or pus, or serum, the effect produced is alike to be dreaded, and, as compared with similar conditions of other organs, it is wonderfully more dangerous to life. The three most important changes within the skull are dependent upon the following causes—1st, upon the circulation in the brain being affected either in quality or quantity; 2nd, upon temporary or permanent mechanical pressure, resulting either from the depression of the bony case, or upon the effusion of blood or serum; and, 3rd, upon actual disease, changing the structure of the brain, and unfitting it for its duties. Besides these, there are also sympathetic affections of the brain, of the exact nature of which we know nothing, all our information respecting them being confined to the fact of their invariable coincidence with certain distant disorders, which are therefore said to produce them "by sympathy."

SUB-SECT. A.—CONGESTION OF THE BRAIN DEPENDENT UPON THE CIRCULATION BEING DEFECTIVE IN QUALITY OR QUANTITY.

349. A great variety of slight disorders of the brain are due either to too great a quantity of blood, or to the reverse, in many cases—to its quality being defective from containing the elements of bile or urea, or from being imperfectly purified by the lungs. Such disorders are often said to be symptomatic of diseases of the three organs concerned, namely, the liver, kidneys, and lungs, but something more than a mere sympathy is here existing, because there is really a tangible cause existing within the brain; and though it is true that all the other organs of the body have a similar kind of blood to deal with, yet, as their functions are not so vitally important, they do not experience the same amount of mischief as in the case of the brain. Whenever, therefore, we find that the liver is not acting at all, and that the elements of the bile are retained, or if the kidneys cease to secrete urine, or when the lungs are rendered incapable of doing their duty from extensive disease in their substance, or effusion of fluid pressing upon them, the brain is either stimulated into over-excitement, or if the disease continues, it is rendered totally inactive, and the result is death. Extreme watchfulness, delirium, drowsiness, and coma, are the various stages manifested, and generally in the order in which they are given. The respective causes may be known by the state of the secretions in the case of the liver and kidneys, and by the blueness of the lips when the lungs are the diseased organs.

350. A DEFECTIVE QUANTITY OF BLOOD in the brain leads to *faintness*, which, when complete, is known as *fainting*, or *syncope*. It appears that the presence of a certain amount of healthy blood is necessary to the carrying on of the functions of the brain; and if from any cause this amount is reduced below a fixed standard, those functions cease, and the result is a loss of bodily power. *True fainting*, as distinguished from absolute disease of the brain, is always the effect of a want of blood in the head, which may be produced by any cause that will cut off the supply, the most common being a cessation of the heart's usual action, in consequence of a want of its proper stimulus—the blood. Ordinary fainting sometimes takes place without any previous warning; but very often there is a feeling of languor preceding it, with slight ringing in the ears, coldness of the limbs, and general sensation of discomfort. All at once, however, the skin, and especially the lips, becomes pale, or perspiration breaks out on the forehead, and the power of sitting or standing is lost, so that the body falls to the ground, while the pulse and breathing are often imperceptible, or nearly so. This state usually lasts from a few seconds to a minute or two, sometimes extending to hours, though in this case the respiration and circulation are partially restored, however imperceptible they may be to an ordinary observer. Great losses of blood, or evacuations from the bowels or kidneys, which are derived from that fluid, are the most ordinary causes of fainting; or the sudden removal of long-continued pressure upon the large vessels, as in the operation of tapping, or in parturition. But, besides these, there are also certain conditions of the nervous system, in which an impression may be produced upon it, which acts upon the heart, so as to suspend its functions; but how, we do not exactly know. Nevertheless, though we cannot ascertain the exact *modus operandi*, we are well acquainted by experience with the fact that certain emotions of the mind will cause this kind of fainting; such as the sensation produced by the sight of blood, or a sudden shock of any kind, whether terror or joy. Even the sense of smell will in some people produce fainting, when either a very agreeable or disagreeable object is presented to it; and, indeed, there is scarcely any limit to the number of sensations which in different individuals will produce this effect. Sometimes it is

difficult to distinguish long-continued fainting (then called *a trance*) from death, and nothing short of commencing putrefaction will settle the question satisfactorily. The best sign, short of this, is the sinking of the cornea, which takes place after death, leaving the surface, as it were, "coddled," to use a familiar expression; for this almost invariably comes on within twenty-four hours of death, and never occurs prior to its advent. From apoplexy it may be distinguished by the state of the circulation, which in that disease is not suspended entirely; while in fainting, when it amounts to the extent which alone could be confounded with it, the pulsations at the wrist are imperceptible.

351. Delirium Tremens, or the *drunkard's delirium*, appears to be a passive congestion of the brain, owing to the sudden cessation of exciting agents which have been long used—such as fermented liquors or opium, or, in some cases, mere mental excitement. The exact nature of the disease is not clearly made out, and many pathologists are of opinion that its essence is wholly of a nervous character. Nevertheless, it is quite clear that in all cases there is more blood than natural in the vessels of the brain when examined after death, and also in the eyes during life, which last are a pretty sure guide to the state of the internal circulation, their vessels communicating very freely with those of the brain itself. It is quite true that there are never found any traces of the existence of inflammation in delirium tremens; but supposing the disease to be passive congestion only, there is no reason to expect any further change than that which we do find, namely, an engorged state of the vessels, and frequently an effusion of serum, apparently by transudation through their walls. A theory has been advanced, that the disease depends upon the actual presence of spirit in the brain, operating as a poison; but, as the symptoms generally make their appearance after the removal of the stimulus, it is not logical to attribute them to a cause which has partially or entirely ceased to exist. Congestion may, however, be taken as the *probable* essence of the disease, and, as it leads to no error in practice, there is no reason why it should not be considered to be correct. The *symptoms* are generally, at first, those of great depression of spirits, with an anxious and dejected countenance, constant sighing, and feeling of oppression at the heart; the nights are restless, and no sleep can be obtained without a certain amount of the usual stimulus, after which it is heavy, and yet disturbed by dreams of a fearful character, so that the patient is not refreshed by it. The appetite is generally wholly gone, tongue furred, moist, and *tremulous*, and the pulse slow and compressible, with a tendency to irregularity. Generally the hands are tremulous, and often in bad cases there is a constant disposition to change the position, so that a continuance in one posture is irksome in the extreme. This is the early stage of the disease, which is succeeded by one of great excitement, in which there is marked delirium, especially at night; an almost entire want of sleep, at all events for more than a few minutes, and then disturbed by sudden tremors and starts, as if from frightful dreams. The head is never clear, though, at times, the faculties may be roused into a tolerably collected state, soon to relapse into wandering and unconnected rambling of ideas. There is almost always a great anxiety to do whatever is ordered, often to such an extent as to contrast painfully with the power of performance. There is a constant worry of mind, as if anxious to do something of great importance, the nature of which does not seem very clear. The circulation now is often roused, and the skin becomes hot, especially that of the head. The feet are, however, almost always cold, and often the hands also. The face breaks out in a copious perspiration, which is of a clammy nature and of a peculiar smell, which can scarcely be mistaken by those who have once met with it. The mind gradually becomes more and more wandering and lost to all perception of surrounding objects, and sleep is almost entirely absent. Hallucina-

tions of a painful nature are very frequent, generally having the fear of some impending danger for their foundation. After a few days of this stage of excitement, if it is not subdued, it is followed by a state of exhaustion very similar to the last stage of typhus fever, in which all the secretions are suspended; but the tongue very seldom becomes dry and brown as in that disease. Death, however, when it occurs, takes place in the same way from the exhaustion of the vital powers; but in most cases the treatment is so well understood, that recovery takes place, unless the attacks have been so many, and the intemperance producing them so great, as to break up the system entirely. In the early stage of the disease, it is not very difficult to detect it, as the absence of all excitement of the heart and arteries marks its non-inflammatory nature, and also its difference from typhus fever with which alone it can easily be confounded. In the second stage, or that of excitement, it is not so easy to decide upon its nature; but the history of the case and the habits of the patient will generally serve, when in the hands of an experienced practitioner, and no one else should venture unnecessarily to decide such a vital question. From mania it may be readily known by the inconsequent reasoning, and the loss of power of applying to the question under consideration, the will being evidently good, but the mind being wholly beyond control.

352. Determination of Blood to the Head, or *active congestion of the brain*, is a disease in which that organ suffers from a defect in its circulation, owing either to some over activity of the heart, or to some local disease in the vessels themselves. The symptoms are a violent throbbing in the carotid arteries as well as in those of the temples, flushed face and suffused eyes, headache especially after stooping, restlessness, in some cases drowsiness, and an incapacity for mental exertion. This state is very apt to lead to inflammation; but it may continue short of that condition for months or years in a person whose blood is not overloaded with fibrine. It may, however, be held as a rule that no one in whom this state of active congestion is developed is safe from its attacks, and provision ought as soon as possible to be made for its speedy removal.

Sub-sect. B.—Congestion from Pressure on the Brain.

353. Temporary Pressure, commonly known as *concussion*, or, in ordinary language, *stunning*, is manifested by sudden cessation or interruption of the functions of the brain without injury to its substance, and is the result of some mechanical violence, such as a blow or fall. In ordinary cases the patient lies for a short time unconscious of all around him, and motionless. After a few minutes, he comes to himself, or he may be roused by others, but then relapses again into his former state of insensibility. This, however, does not last long, and goes off gradually with slight vomiting, and some little giddiness and drowsiness for a few hours. In more severe cases of concussion the insensibility is profound, the skin cold, features shrunk, and with an expression of suffering, pulse feeble, and the breathing slow, sometimes with, at others without snoring. Vomiting occurs in all but very severe cases, and comes on as the brain is recovering itself.

354. Compression may be either the result of blood being effused from a diseased condition of the vessels causing a rupture, and then called *sanguineous apoplexy;* or from the same occurring in a healthy state from an injury to the head, such as a blow or fall, and known as *extravasation:* or from a serous fluid being thrown out from the vessels, and known either as *serous apoplexy* in the adult, or *water in the head* (hydrocephalus) in the child; or from inflammation ending in the formation of *pus;* or from pressure caused by a fracture of the skull, or a living growth from it.

355. Apoplexy may be known by the sudden loss of sensation, voluntary motion, and intellect, without a corresponding diminution of the circulation and respiration as in fainting, and

without the capability of being roused as in ordinary sleep. The attack may be instantaneous and at once complete, so that the body falls to the ground; or it may be more gradual, the patient putting his hand to his head, and complaining of pain there, and then gradually becoming insensible. Prior to the attack, there is in most cases more or less warning, in the shape of fulness of blood, or pain, or drowsiness, or all of these combined. After it is established, there is a great difference in the degree in which the functions of the body are interrupted; for, while in the most severe cases, sensation, voluntary motion, and the operations of the mind, are all entirely suspended, in slighter affections the patient retains some degree of consciousness—he is sensible to certain impressions when roused, and can move himself slightly at his will. Very often one side of the body lies motionless and insensible to pain of all kinds, while the other is slightly convulsed. Respiration is generally more or less affected, being sometimes only a little slower than usual, but generally laborious, and attended in severe cases by the peculiar kind of snoring and puffing of the lips which is called *stertor*. The pulse also varies a good deal, being often full, hard, and slow, and at other times small, weak, and irregular, the latter indicating a great amount of mischief in the brain. The power of swallowing is generally retained for some time; but in almost all fatal cases, it is lost from the first, or very soon after the attack. Apoplexy may last only for a short time, and then gradually disappear; or it may go on in all its severity for weeks, and still allow of the recovery of the patient; or it may be fatal in a few minutes or hours. In a large proportion of the attacks, a partial loss of power in some of the muscles of the body is left behind, which may, however, ultimately be restored; but the proportion of these recoveries is not very large. This affection is called *paralysis* or *palsy*; and when confined to a lateral half of the body, *hemiplegia*; or to the lower half, *paraplegia*, which last is caused by disease of, or pressure on, the spinal cord rather than the brain. In all cases of apoplexy there is a disposition to return; and where it has once occurred, it may generally be assumed that, sooner or later, this disease and no other will be finally fatal. Sometimes a great number of slight attacks have been recovered from; but, as a rule, it may be held that few survive the third, and the majority succumb on the supervention of a second. The disease is not confined to any age, but is rare in the early periods of life. It is very common in old age, and cuts off a large number of those who live beyond sixty years. Many people suppose that a short neck and large head predispose to the disease; but it appears to be more dependent upon internal conformation than external, and upon intemperance more than on either; so that a spare habit and long neck in a man who indulges in the pleasures of the table, if at the same time he uses his brain to any great extent, would be more likely to lead to apoplexy than would the reverse in a man of altogether temperate and quiet habits, especially if taking a fair share of healthy bodily exercise. It is impossible during life to ascertain with certainty whether apoplexy is produced by blood effused on or in the brain, or by serum in the same situations, or by disease of the membranes, or of the substance of the brain. Indeed, many cases of apoplexy are recorded in which the symptoms were well marked, and yet, on examination after death, no alteration in structure could be discovered, nor any cause whatever for the disease. Usually, however, there is an effusion of blood from the rupture of a vessel, which may be on the surface, or it may be in a cavity formed by the pushing on one side of the brain-fibres themselves, and the substitution in their place of a clot of blood. Even in this case death is not certain, for many brains have been examined after death from other causes, in which an old clot has been found partially absorbed, and evidently in a state which would have ended in total removal, if life had continued for some time longer.

356. THE EXTRAVASATION OF BLOOD, as a consequence of accident, is attended with the same symptoms as apoplexy. At first, it is almost impossible to distinguish between the symptoms of concussion and those of compression from effused fluid or depressed bone in a fracture of the skull; but when the symptoms, instead of yielding and improving, go on steadily increasing in severity, it may generally be concluded, that there is some greater mischief done than a mere concussion. A simple fracture of the bones of the head is not always attended by urgent symptoms, and many cases are well known in which the skull has been undoubtedly extensively fractured without any mischief resulting. On the other hand, if the base of the skull is fractured, generally indicated by bleeding from the ears, there is a great probability of the large vessels at the base or the brain being ruptured, and of consequent pressure upon the brain from extravasated blood. When a bony growth gradually takes place from the interior of the skull, the symptoms are so obscure as to require the skill of a practised surgeon to detect the existence of the mischief, and even with all his acumen, the opinion formed may be without a corresponding foundation.

357. MATTER OR PUS when thrown out as the result of inflammation will produce all the symptoms of apoplexy by the pressure which it exerts upon the brain, but being a sequel to inflammation in most cases, it is better to consider it as a part of that disease.

SUB-SECT. C.—IDIOPATHIC INFLAMMATION OF THE BRAIN AND ITS MEMBRANES.

358. INFLAMMATION OF THE BRAIN itself *(phrenitis)*, and of its membranes *(meningitis)* have been distinguished by most modern writers as two separate diseases, and so no doubt they are, and *post mortem* examinations show that the one often exists without the other; but the symptoms of the two have never yet been so clearly made out as to satisfy the professional enquirer; and it is consequently useless to attempt to give any criterion by which the amateur may hope to be able to effect the task. I shall, therefore, describe the usual symptoms which are common to them; at the same time remarking, that if the disease is made out to be either of them, it is high time that the best medical aid which is at hand should be summoned, so that after all the matter is one of little interest to any but the members of the medical profession. ACUTE INFLAMMATION OF THE BRAIN, sometimes called *brain fever*, commences suddenly with great irritation or excitement of the mental faculties. There is intense pain extending over the greater part of the head, violent delirium, with extreme acuteness of the organs of sense, so that the faintest light or the slightest sound is insufferable. The eyes are wild, bright, and red, with contracted pupils; pulse rapid, full, and hard; tongue dry and red, often tremulous; respiration quicker than natural, with the other general symptoms of fever—namely, hot skin, scanty and high-coloured urine, and occasional rigors. In very bad cases, there are often convulsions, or sometimes rigidity of the muscles of part of the body, or in milder ones, twitchings of the muscles of the face. When these symptoms have existed for some hours, varying from twelve to sixty without diminution, collapse comes on, with *subsultus tendinum*, freedom from pain, stupor, and coma, which are soon followed by death. The chief diseases with which it can be confounded are *typhus fever* and *delirium tremens*; from the former of which it may be known by its rapid onset, and from the latter by the symptoms detailed at par. 351. From mania it may be readily distinguished by the general symptoms of inflammation.

359. CHRONIC INFLAMMATION OF THE BRAIN may be confined to the membranes or to *part of its substance*, the whole brain when inflamed being invariably acutely attacked. The signs

of the former are, slight delirium soon passing into a state of mental excitement, and subsiding into a state of idiotcy. These symptoms are accompanied by a dull aching pain in the head, and by general symptoms of slight inflammation—namely, a pulse not nearly so rapid as in the acute form, a cooler skin, and less suffusion of the eyes, which indeed are sometimes little altered, except in expression. It is a very difficult disease to detect, and may easily be confounded with mania.

PARTIAL CHRONIC INFLAMMATIONS OF THE BRAIN are also not very easy of detection, being often insidious in their approach, and the symptoms easily referrible to congestion from some one of the causes mentioned under the sub-sect. A. It comes on slowly, with a fixed, deep seated pain in the head, dimness of sight, and giddiness. Very often there are cramps in the extremities, with a sensation of tingling in them, and an unsteady gait in walking. These symptoms are unaccompanied by fever; but the general health is always more or less impaired, and the mind is restless, and incapable of being applied to any subject long together. When they are allowed to go on for any length of time without relief, there is generally a sudden attack of coma or convulsions; or perhaps, a partial paralysis is the first symptom remarked, and this may even be temporarily removed without the disease yielding, in which case a second attack is almost sure to take place. In some cases the progress is still more slow and obscure, and the paralysis is the first prominent symptom observed. Here the muscles affected are generally those of the legs, and the spine is the part chiefly diseased, though sometimes the brain is also implicated. The mind is generally debilitated as well as the body, but exceptions to this occasionally take place. In this disease the legs are dragged over the ground, without the power of lifting the foot, and the catching of the toe is often the first symptom noticed by the patient. These partial diseases of the brain are usually attended by either softening (*rammollissement*), or by hardening of its substance, both being results of chronic inflammation; or the brain may waste (*atrophy*), or it may enlarge or grow unnaturally (*hypertrophy*). Softening arises from the pouring out of pus into its texture (*white or yellow softening*), or of blood (*red softening*); while hardening is the result of the deposition of lymph amongst its fibres. Besides these alterations of structure. as the result of ordinary inflammation, the brain is also subject to the tubercular deposit, which is of a scrofulous character, and ends in producing inflammation; and to cancer and other malignant diseases, all interfering with its functions, partly by the pressure which they exert upon it, and partly by their presence causing congestion or inflammation.

360. HYDROCEPHALUS has been already alluded to at page 79. It may be either *acute* or *chronic*. In *acute hydrocephalus*, there is almost always some derangement of the digestive organs existing for a shorter or longer period prior to the appearance of disorder in the functions of the brain. The appetite is either very capricious, or it is lost; the tongue furred, and the breath foul. The stools are almost always unnatural, and either deficient in bile, or, if there is any present, it is of a dark green colour. Costiveness also generally exists of an obstinate character; but, on the other hand, the reverse may take place, from the irritating nature of the secretions. The urine is high-coloured and scanty, the skin is pale, and the features shrunk. When these symptoms have existed some little time, and, indeed, sometimes coincidentally with them, there may be noticed a general derangement of the nervous system, and especially of the functions of the brain, as indicated by a languor and drowsiness, with disturbed and restless sleep; also by slight pains in the head, *and soreness in various parts of the body.* The child becomes silent, and, though irritable, it is not capable of being roused to the enjoyment of any of its usual means of amusement; yet there is very little complaint made,

and careless nurses are apt to overlook these manifestations of a disease so alarming in its after progress. As the attack progresses, however, flushings and chilliness alternate, and the muscular power is slightly beyond the control, so that the gait becomes unsteady and even staggering; but these are not generally developed until a later stage. Beyond these, the following may be noticed as occasional signs of the advent of hydrocephalus. A frequent, sharp, parrot-like cry, without any apparent cause; clenching of the fist, with the thumb inside the fingers; a half-convulsive throwing back of the head, and a great and unusual wakefulness. The child is now unable to support the weight of the head; is constantly sighing, and looks dejected, with a dull leaden eye, now and then lighted up by an expression of pain and anxiety. A strong light is complained of, and if admitted, occasions frowning and cries of pain. The bowels are still more deranged, and the pulse becomes rapid and sharp. There are frequent flushes of heat, accompanied by sharp local pains, especially in the nape of the neck and abdomen. In severe and very acute cases, the fever often runs very high, and the symptoms are very similar to those of infantile remittent, which can be referred to at page 29. If the inflammation or congestion of the brain is very severe, the fontanelles are raised above the level of the surrounding scalp, and are felt to beat strongly under the finger; while the whole of the head is hot, and the child screams with pain, which is referred to the head by the hand being constantly carried to it. It may, however, be remarked, that the head-symptoms, and indeed the whole group, vary considerably, so that it is almost impossible to give any clear idea of the disease as to severity, the forms in which it appears being almost countless, and requiring a description of twenty or thirty cases to include them all. Still, it will be found that, though varying in degree, the type of any one may be observed in the set given above, that being the most usual, and the symptoms probably presenting themselves in nine cases out of ten, with slight modifications, according to age and temperament. After a week or ten days of the period of active mischief, the symptoms either abate, or there is reason to believe that effusion has taken place, as characterised by *constant* squinting, convulsions, or coma. At first, the shrill screams are more marked than ever; but afterwards they gradually subside, and the drowsiness, which becomes more and more marked, merges in more or less complete insensibility to all external impressions, varied by convulsions. These may be of every degree, from slight twitching of the muscles of the face up to violent contractions of the whole body. When these last occur, the one side is generally soon paralysed, the other continuing to be occasionally convulsed; at the same time, there is often a raving delirium, with moaning, and rolling of the head from side to side. The cheeks are alternately flushed and pale; *the eyes half shut*, and the whites red, while the cornea looks glazed and dim. The teeth are almost always ground together violently; the feet and hands now grow cold, while the head in turn is hot, with an increasing and permanent fulness at the fontanelles, which, however, do not pulsate so strongly as before. The pulse grows weaker and weaker, the respiration unequal and stertorous; and at last a convulsion, more violent than usual, puts an end to the anxieties of the attendants. The length of this stage varies from one day, or even less, to two or three weeks; so that it will be readily understood that the whole disease runs a very uncertain course in point of duration, the average being probably three weeks. In very young infants, it often runs its course in a week or ten days; and in children of five or six years of age, four, five, and six weeks will frequently elapse before the recovery is clear, or death takes place.

361. Chronic Hydrocephalus is a very different disease to that already

described, and its advent is so insidious that, until the enlargement of the head occasioned by the effusion of serum, is manifest, it is very seldom discovered or discoverable. It may even exist prior to birth ; and instances of enormously distended brains are well known to every practitioner of experience in the department of midwifery. When the head becomes very much enlarged, as the face retains its ordinary dimensions, the countenance seen in front assumes a triangular form; and the patient being unable to support the enormous weight, the head falls on one shoulder or the other. The sections of the skull continue open, and, indeed, spread considerably in bad cases, so that the pulsation of the brain may be felt along their course. Sometimes a tumour will make its appearance at some point, indicating a giving way of the membranes there from the enormous pressure. At other times, however, the head is very little increased in size, but this is the exception to the rule. When the disease comes on at the age of two or three years, there is generally more or less excitement of the nervous system, as evidenced by unusual irritability of temper, loss of memory, and general debility. Epileptic fits often appear, and the pupil of the eye enlarges in a remarkable manner accompanied sometimes by amaurosis, as indicated by evident blindness. By shaking the head, or when gentle pressure is made by the fingers on the fontanelles, stupefaction is produced. Hearing is also impaired, and the senses of smell and taste are sometimes lost, or very nearly so, though these are generally retained longer than the others; grinding of the teeth is so constant, as always to occasion alarm, when united with other symptoms of the disease. The saliva dribbles from the mouth, and the countenance wears a half-idiotic look, which is very painful to the friends of the poor little patient. The functions of the digestive organs are badly performed; but the appetite is very often voracious at first, occasionally followed, however, by vomiting; and there is generally obstinate constipation, with light-coloured evacuations. The urine is scanty and high-coloured, and perspiration is rare, but the skin is greasy and offensive in odour. As the disorder advances, the pulse and respiration become affected, the patient sighs continually, and a cough often occurs, which is of a spasmodic nature. There is considerable unsteadiness of gait; and involuntary startings of the limbs are a very peculiar sign of the disease. The intellect is generally impaired in proportion to the progress and severity of the disease; and at length it is so far in abeyance, that the patient becomes a mere automaton, and vegetates rather than lives. Yet there are cases on record in which the head has reached an enormous size without loss of intellect, and all the senses being even more active than usual. Chronic hydrocephalus may take its rise either before birth or after it, or more rarely during the later periods of childhood. The duration of the disease is various. If congenital, death takes place at or very soon after birth ; and if it comes on before the end of the first year, the child rarely lives through the third. Sometimes, however, the brain becomes habituated to the presence of the fluid, and life is prolonged to a late period, instances being known in which hydrocephalic patients, with largely distended brains, have reached the middle period of life. There are also instances of recovery, either by absorption of the fluid, or from its evacuation by art.

362. THE CAUSES of hydrocephalus are but obscurely revealed to us, though it is an undoubted fact that some families are peculiarly predisposed to it. Mechanical injuries, such as falls or blows, are supposed to originate it ; and suppression of cutaneous eruptions also gets the credit in some instances, probably with reason. The rapid development of the brain at the season of life when hydrocephalus is prevalent, renders that organ peculiarly liable to disturbance of the circulation ; and there is little doubt, that in proportion to the development of the brain, and *its*

stimulation by the attendants of the child, will be the tendency to this disease. Scrofulous children are particularly liable to it; and, when they have a large brain, with an excitable temperament, great caution should invariably be exercised in allowing of any additional stimulus beyond the natural inclination of the child to investigate every subject within its reach. Disorders of the digestive organs, difficult dentition, scarlet fever, measles, and small-pox, are all occasionally precursors of the disease; and lastly, maternal frights during pregnancy, are alleged by some writers, but with how much cause it is difficult to say, though, reasoning from analogy, it may probably be assumed that they deserve some credit in this enumeration.

363. THE PRECISE NATURE of the disease is always either congestion or inflammation of the membranes, which may either be confined to them, or, as is generally the case, co-incident with a similar condition of the whole contents of the cranium. Therefore, although hydrocephalus is considered as a disease in itself, it is really only an unfortunately fatal symptom of general congestion or inflammation of the brain, which manifests itself by an oozing of water through the serous membrane covering and lining that organ. From this it may readily be understood that the disease which we call hydrocephalus often goes on to destroy life by interfering with the functions of the brain at a stage prior to that in which serum is poured out. This delicate organ will not bear excessive congestion or inflammation, if sufficient to impair its controlling power over the general system, and, as a consequence, death ensues, from a cause which, if somewhat less severe, would have allowed life to linger until it was annihilated by the pressure due to the effused fluid. Many parents are surprised at being told that their children have died of hydrocephalus, and have met the assertion by the objection that the head was not increased in size; and, if it has been opened, and no water found, a still greater amount of scepticism is expressed. Nevertheless, it is the name which is defective in such a case, and not the medical attendant, who has been compelled to use the only one which is adopted by nosologists, and has perhaps not thought it worth his attention to endeavour to explain the apparent anomaly. Such false reasoning, however, often has taken place; and if the case is allowed to remain unexplained, it will leave a sting in the breasts of the relations of the child, which it is neither humane to them, nor politic to the profession to allow. For these reasons, I have dwelt at greater length on this subject than its importance might otherwise admit of. It must also be remembered that this effusion may be the result of mere passive congestion, or of active congestion, or absolute inflammation of the brain—three conditions of the blood-vessels and their contents, which are quite different in their nature, as we have seen at page 41, and in the treatment required, as we shall hereafter find, when the treatment of disease comes under consideration.

SUB-SECT. D.—EFFECTS OF INFLAMMATION OF THE BRAIN.

364. PARALYSIS OR PALSY is always a disease of the nervous system, which may or may not depend upon inflammation of its structure, and although generally showing itself secondarily in the loss of muscular power, it is not always so, as there may be a paralysis of sight, taste, or hearing, or in many cases of sensation in the skin. Like headache, it may be considered to be a symptom of some special disease, rather than a disease in itself; and it is mostly dependent upon organic change in the great nervous centres. It is generally divided into two leading kinds, viz.—paralysis of the *nerves of sensation*, and paralysis of the *nerves of motion*.

365. PARALYSIS OF THE NERVES OF SENSATION may be of the nerve of sight *(amaurosis)*, or of hearing *(deafness)*, or of the sense of smell, or that of taste, or lastly of the ordinary nerves of sensation throughout the

body. The symptoms of each of these are so well known, as to need no description, with the exception of amaurosis and deafness, which will be described under the special disease of the eye and ear.

366. Paralysis of the nerves of Motion may be either general when the injury or disease implicates the whole of the nerves of the body, as for instance, in what is called a broken-neck, or it may be of one side only *(hemiplegia)*, or confined to the lower half of the body *(paraplegia)*, or it may extend to the motor nerves of the face, and is then called facial paralysis. Again, it may be confined to certain other limited sets of nerves, as in the *wrist-drop*, peculiar to lead-palsy, or lastly, there may be a trembling kind of palsy, in which the power is not wholly lost, and which is called the *shaking palsy*.

367. Hemiplegia occurs most frequently on the left side, and generally comes on suddenly, either with or after an attack of apoplexy. The power of motion may be either wholly or partially lost, and sensation may or may not accompany it. The mental faculties are sometimes impaired, and at first they almost always suffer, for it is seldom that the memory is quite as good after an attack as before. The arm is generally the first to be attacked, and the last to recover its power. The seat of the disease is within the brain on the side opposite to that affected.

368. Paraplegia, when complete, is marked by entire loss of motion and sensibility in the lower extremities, including also the bladder and rectum. The urine is generally highly ammoniacal, and inclined to deposit phosphate of lime. In the milder forms the legs are merely weaker than usual, with a tendency to drag the toe, and a tingling or numbness of the skin. The disease is generally due to softening of the spinal cord, the result of chronic inflammation, or to an accident to the spine, in which the cord is involved, or sometimes to spinal disease, the bones pressing upon the cord.

369. Paralysis of the Face is marked by a loss of power in the muscles of the face only, so that the two sides are not symmetrical, and the mouth is drawn *away* rom the affected side. At first sight, the ordinary observer would conclude that the opposite of this is the real state of the case; but, on examination, he will see that the paralysed side being relaxed, the healthy muscles contract, and drag it towards themselves. It is due to some disease or pressure upon the roots of the nerves which supply these muscles.

370. Lead Palsy, or *wrist-drop* is so clearly marked by the loss of power in the extensors of the hand and wrist, attacking only those who use lead, that it is needless to describe it more fully. It begins very gradually, by a sensation of weakness in the wrist, which goes on by degrees, until the hand is quite useless; the fingers, though capable of contraction, are beyond the control in attempting to open the hand without aid.

371. Shaking Palsy is also a gradually encroaching kind of this affection, showing itself first in the hands, arms, and neck, which can never be kept still, and afterwards attacking the lower limbs. It generally goes off during sleep, except in the very advanced condition, when occasionally it happens that the shaking continues even then. Mastication and swallowing are performed by snatches; and at last the evacuations pass involuntarily, and come away constantly. It is often the result of hard drinking of spirits, but it sometimes follows inflammation and softening of the spinal cord from other causes.

372. Headache can scarcely be called a disease in itself, being rather a symptom of some general or partial disturbance of the brain, or some of its coverings, or of sympathy with some other organ; but this last is generally more or less caused by a physical alteration in the quantity or quality of the blood circulating in the head. Nevertheless, for convenience's sake, it will be well to treat it here as a distinct disease, so that the inquirer may be able, when an attack of it is before him, to ascertain its precise nature and cause. The following are enumerated

by writers on the subject as the most usual causes of headache, viz.,—1, rheumatic inflammation of the pericranium; 2, inflammation of the mucous membrane of the frontal sinus; 3, mental excitement; 4, strong or long-continued impressions on the senses of sight, or hearing; 5, excessive impetus of blood to the head; 6, impeded return of blood from the head; 7, congestion of the brain; 8, suppression of perspiration, urine, bile, &c.; 9, inflammation of the brain; 10, organic disease within the head; 11, sympathy with the stomach; 12, constipation; 13, the use of narcotics or stimulants; 14, worms in the intestines; 15, changes in the pressure or heat of the atmosphere; 16, neuralgia. Many of them have been already treated of; and it remains, therefore, only to consider the following, namely—the *rheumatic*, *congestive*, *dyspeptic* or *sympathetic*, *periodic*, and *organic* forms of headache.

373. Rheumatic Headache is chiefly confined to the back and front of the head, where the thin layers of the *occipito frontalis* muscles are expanded, and also in some cases extending to the temporal muscles just above and in front of the ear. The pain is generally inclined to remit at times, and shoots from point to point, often running downwards along the jaw—the muscles of which are sometimes implicated at the same time. The pain is almost always worst at night; and it may be increased by deep pressure or rubbing of the scalp against the bones beneath. It is generally the result of some exposure to cold, especially a draught of air; and those who are once attacked by it are liable to frequent returns. The stomach is usually more or less disordered, but in other respects there is seldom much constitutional disturbance.

374. The Congestive Headache is characterised by an obtuse pain in the whole of the head, which is worst at the fore and back parts. It occurs in three different kinds of constitution, namely—in those over-loaded with blood; in those whose brains are of such feeble material as to be incapable of bearing the slightest derangement of circulation; and in those whose nervous system is so irritable as to be constantly upsetting the balance of the circulation. It is necessary to consider these variations in treating congestive headache, as the management of it would vary greatly in the three classes. When headache occurs with this overloaded condition of the blood-vessels, the countenance is bloated, the eyes are full and red, and the expression of the features is dull and inanimate. The liver is generally sluggish, and there is a great tendency to inflammation of the brain, followed by apoplexy or paralysis. If headache attacks the weak brain, it is usual in those who have been afflicted with some long continued discharge, which has reduced the strength of all the organs, but especially of the brain, but having from some cause ceased to continue, there is a sudden increase of the quantity of the blood without a corresponding accession of strength in the head. In such cases there is usually a pale and sallow countenance, a slow and languid pulse. The feet often swell, and the slightest exertion is followed by excessive fatigue, with palpitation and increase of the pain in the head. In the irritable temperament, the mind and the whole nervous system with it have generally been cultivated at the expense of the body; and the heart is susceptible of the slightest stimulus, so that any emotion is sure to set it beating more rapidly than usual, while the brain is so delicate in its organization that this produces intense pain of the kind which is called a "nervous headache." Females are particularly subject to this form of headache, especially those who do not take sufficient exercise, and who indulge in the exciting occupation of novel-reading to the exclusion of more temperate recreations.

375. The Dyspeptic or Sympathetic Headache is produced in many people by any cause which upsets either their stomach, liver, or bowels. Thus, in some persons, it occurs after the slightest error in diet, or even in consequence of waiting half-an-hour

beyond the time of the accustomed meal. Very often the sufferers from this species of headache can use their brains to any extent without injury, *as long as they keep their stomachs and bowels in good order*, showing that the fault is not radically in the brain itself, but in the digestive organs. This form of headache varies greatly according as it is connected with irritability of the stomach, or with torpidity of the liver, or with constipation, which last is very apt to co-exist with the second of the two causes, the non-secretion of bile being very often its chief cause. In the *stomach* or *sick-headache* the pain is generally over one eye or temple, and the ball itself is often exquisitely tender. The pain may be dull or acute, but is more commonly the latter, and sometimes there is even an evident increase of the action in the temporal arteries during its continuance. *Sick-headache* when complete usually makes its appearance the first thing in the morning, and is accompanied with a most distressing nausea, often increasing to absolute vomiting of the mere contents of the stomach. The pain and sickness generally last the whole day, and even through the night and part of the next day, beyond which period it is rare to find it extend. Sometimes, however, it is much more gentle and transient in its course, comes on at any hour when the stomach is upset by mental agitation, or from fasting too long, and then generally lasts through the night, disappearing the next morning if sleep has been obtained. The headache produced by torpid liver or constipation, or by both occurring together, is much more dull in its kind, and more gradual in its onset. It also varies more in degree, which seems to depend exactly upon the amount of torpidity, or the extent and duration of the constipation. Many people suffer from the slightest amount of either, so that the moment the bile ceases to flow in its proper quantity, the head becomes dull and inclined to ache, the symptoms going off after a ride on horseback or a good walk, or any cause which will set the liver going. So also the postponement of the usual evacuation of the bowels even for half-an-hour, will give many people a headache for the rest of the day, while others may defer this healthy process for days, or even weeks, without suffering any discomfort. In both these last causes, however, there appears reason to believe that the blood circulating in the brain is mechanically as well as chemically affected by the torpidity in the secretion of bile, and by the obstruction to the flow of blood through the intestines and the general contents of the pelvis, which accompanies constipation.

376. PERIODIC HEADACHE is so generally confined to the forehead, that it has received the name of *brow-ache*, while others have given it the title of *neuralgia* of the head, all being names which have no definite meaning, and only serving to let us know that the disease in question is of a nature with which we are unacquainted. The periodic form is, however, peculiar to it; and sometimes the returns are as well marked as in ague itself, though the intervals are commonly longer, and often extend to weeks or months. Sometimes, exactly one-half of the head is affected, while the other is quite free from pain, and this is the form known as *hemicrania*. Periodic headache resembles the rheumatic form, in some respects; but it may be distinguished from it by the regularity of its attacks, and by the absence of the soreness which is so conspicuous in the latter.

377. HEADACHE depending upon organic disease is as rare as the disease itself, and can scarcely be detected by any symptoms during life. It is scarcely necessary, therefore, to enlarge upon it here.

SUB-SECT. E.—CONGESTION AND INFLAMMATION OF THE SPINAL CORD.

378. INFLAMMATION OF THE SPINAL CORD is marked by a *dull* aching sensation in the spine, with partial or entire loss of sensation and voluntary motion. The intellect is not impaired—according to the seat of the disease is the derangement of the nerves which

are connected with that part. Thus, if the cord in the neck is affected, the arms are paralysed, or permanently contracted or convulsed, and afterwards paralysed. When the back is the seat of the disease, the lower limbs are more or less affected in the same way; and, in addition, the muscles of respiration and of the abdomen are slightly cramped or convulsed. Should the lumbar portion be the part to which the disease is confined, paraplegia more or less complete is the invariable concomitant. The disease almost always comes on insidiously, and is often accompanied by great tenderness on pressure of the part of the spine which corresponds with the seat of the disease, and by pain when a very hot sponge is applied, greater than is accounted for by its mere heat.

379. SPINAL IRRITATION, OR ACTIVE CONGESTION OF THE CORD, is almost peculiar to the female sex, though occasionly met with in young men of a very weakly constitution. It is marked by nearly the same symptoms as in the early stages of inflammation, but not going on to produce paralysis or convulsion. There is always more or less pain on pressure of the spine when the cord is congested, or on the application of a hot sponge to it, or after walking or standing. This is connected with palpitation, shortness of breathing, pain in the side, depression of spirits, constipation, flatulence, and very often with hysteria.

380. EFFUSION OF BLOOD OR SERUM in the spinal canal causes pressure on the cord, and is followed by the same symptoms as are detailed under the head of inflammation of the cord, of which they are always the effect, unless caused by accident.

SECT. 3.—CONGESTION AND INFLAMMATION OF THE NERVES.

381. Independently of the effects of disease in the nervous centres, and from them propagated along the nerves, these last are also apparently subject to local diseases, of the exact nature of which we know little or nothing. In some there is reason to believe, that congestion or inflammation is the essential feature as in ordinary secretion, but in others the cause is altogether obscure, as in neuralgia and local loss of sensibility.

382. By NEURALGIA we understand an obscure local pain, not connected with inflammation or organic change in any other structure, and though sometimes clearly caused by congestion or inflammation of the trunks of the nerves, yet in others apparently without any such condition. It is, therefore, rather by the presence of pain without apparent cause for it, than by any other set of symptoms that it can be defined. In treating of inflammation, pain has been set down as one of four symptoms constituting that diseased condition; but without the other three it may exist, and receives the character of *nervous*, or when developed under certain circumstances, the name *neuralgia* is given. This is especially the case when the pain follows the course of some nerve, or when it is confined to the exact space supplied with the branches of any particular nerve. In the most marked cases, the pain is of an excruciating kind, and is sharp and stabbing, or, as it is sometimes described, "like a red-hot knife." It comes and goes for a longer or shorter period, and is often aggravated by the slightest touch either of the finger or any other body, or sometimes by a draught of cold air. If the pain is felt in the face, near any of the small muscles there situated, some one or two of them are generally spasmodically affected, and slight twitchings are felt when the pain comes on. The occurrence of this pain is so sharp and sudden in the face, that it is called *tic douloureux*, which is the name by which it is most commonly known. It often comes on after long intervals of rest from it, and then continues with short intermissions for an unlimited period. Most commonly it attacks the branches of the fifth pair of nerves as they spread over the cheek and side of the face. Sometimes a part of the skin is exquisitely tender to the touch, and this is especially the case in hysterical females. Here the seat of the pain is evidently some obscure affection of the nerves,

since there is no other sign of inflammation and nothing else to show for it. It is usual, therefore, to consider it nervous, and to treat it accordingly.

383. **Sciatica** is a painful affection of the sciatic nerve, and is known by the presence of an acute darting pain down the back of the thigh, and in some cases along the outside of the leg to the ankle. It is generally increased by firm pressure along the course of the nerve. This disease appears to consist in congestion of the vessels of the nerve, as they are found loaded with blood if examined after death. It may readily be distinguished from rheumatism of the muscles by being confined to the course of the nerve, and by not being increased on moving the limb or straining the muscles, without implicating the nerve.

384. **Tetanus**, or *locked-jaw* as it is familiarly called in this country from one of its most common symptoms, though showing itself in the shape of a rigid spasm of some of the muscles of the body, is really seated in the nervous system. Sometimes it comes on without any special cause, and is then said to be *idiopathic;* but more frequently it is produced by the irritation of some nerve, as for instance, after an amputation or a lacerated wound, when it is called *traumatic.* The symptoms are much the same in either case, commencing with a slight stiffness of some one or more muscles, and gradually increasing until a part of the body is rendered permanently rigid by a spasmodic contraction of its muscles. When those of the jaw alone are affected, it is called *trismus* or *locked-jaw.* If the muscles of the back are the seat of the disease, the body is bent into a bow, with the abdomen prominent, to which the name *opisthotonos* is given; or, if the contrary takes place, and the body is bent forward, then it is *emprosthotonos;* or *pleurosthotonos*, if bent on either side. But generally, after either of the above varieties has existed for some time, the whole body becomes implicated, and every voluntary muscle is more or less affected. These violent contractions occasion the most excruciating pain, the respiration being partially suspended during their most urgent action, while the action of the heart is accelerated, and the skin becomes hot and feverish. Every ten or twenty minutes the contractions relax slightly in severity, but do not entirely go off, and they seem to gain fresh power with each succeeding remission. Sleep is very seldom obtained, but if it occurs, the attacks do not then come on. In fatal cases, the spasms become more and more severe, the breathing is laborious, and the strength is worn out, death taking place from suffocation, caused by spasm of the muscles of the larynx. Sometimes the disease lasts as long as two months, and at others, it has been fatal in a few hours. There is no difficulty in distinguishing it, the poisonous effects of strychnine being the only similar affection of the nervous system and muscles. Hydrophobia may perhaps be mistaken for it; but the peculiar dread of liquids and of a current of air mark that disease with great certainty, and, in addition also, there are none of the violent spasms of tetanus.

385. **Hydrophobia** is first detected by an unusual difficulty in swallowing liquids, or by a dread at the sound of water poured out, or of air in motion. Each of these produces a peculiar horror and dread; and, if an attempt is made to overcome the reluctance to swallow a liquid, there is immediately a slight convulsion. The nervous system is in a highly irritable condition, so that the slightest noise, or the contradiction of any expressed wish, stirs up a paroxysm of alarm and suspicion which it is painful to witness. The eyebrows are contracted, with the eyes wild, staring, and set. There is great thirst, a dry tongue, and the saliva is viscid. The mind remains sound, though the control over it is partly lost, so that the sufferer is aware of his irritability, and yet unable to control it. Towards the last there is a sense of suffocation, and convulsions actually occur, in one of which death generally takes place. The duration of the disease is from two to four days. It is supposed that

it always follows the bite of a rabid animal, and that an interval of time, varying from a fortnight to many months, always occurs between the bite and the outbreak of the disease. Nothing is known of the exact nature of hydrophobia, nor has any remedy ever been discovered for it. As far as we know, it appears to be dependent upon some intense excitement of the nervous system; but this is only conjecture, and is not supported by any direct proof. In order to guard against the disease occurring in man by inoculation from the dog, it is important to be able to recognise the presence of the disease in him; and, therefore, I shall subjoin the symptoms as generally presented in the canine species. It has lately been asserted by Mr. Grantley Berkeley, who has had great experience in canine madness, that these animals have the same dread of water as is exhibited in man; but this is really not the case, and the evidence of all modern observers is opposed to that gentleman. I have myself watched three cases of undoubted hydrophobia in the dog—in two of which it was communicated to others—and in all three there was not the slightest dislike of water, but the reverse; though, towards the last, the power of swallowing was gone. This is a most important question to settle; as, if Mr. Berkeley is to be received as an authority on this matter, and is not correct in his opinion, many dogs which are really mad will be suffered to communicate the disease. But, as I am satisfied that he is wrong, I must caution my readers against adopting his theory, and shall describe what I have seen, as well as what others have considered to be the essential features of the disease in the dog.

386. THE SYMPTOMS of hydrophobia in the dog are very much the same in all cases, though varying somewhat in their manifestations. The first and most marked is a change of disposition and temper, so that the naturally good-tempered dog becomes morose and snappish, and those which are usually fondling in their manners are shy and retiring. Sometimes the change is even so great, that the usually shy dog becomes bold; but this is not nearly so common as the opposite extreme. Generally, the mad dog shows a warning of his coming disease by this change of manner for several days before it breaks out with severity. When these premonitory symptoms have lasted an uncertain time, varying from twenty-four hours to three or four days, the dog begins to attack imaginary objects, and if real ones are presented to him, he will tear them savagely to pieces. He is now exceedingly irritable, and wanders restlessly from place to place, having apparently a strong desire to do something, but not caring what that is, so that he is not quiet. If he is confined by a chain he will try and gnaw it to pieces; and if restrained by a door within narrow bounds, he vents his fury upon that. In this state he knows not the sensation of ordinary pain, but will bite a red-hot poker presented to him exactly as if it were a cold one. As the disease advances, water is eagerly swallowed, but, in his hurry, the dog will generally upset his stock of that fluid; and hence he is often thought to be unable to swallow, whilst all the time he is burnt up with thirst, and will constantly imbibe it, if he can do so without knocking over the vessel containing it in his haste. The howls and groans are generally peculiarly deep and melancholy, and by them a mad dog *in confinement* may often be recognised, though sometimes the dog is quite silent, and in that state is said, in common language, to be "dumb mad." When at large, however, no warning noise is made, and the dog seems only determined on a straightforward trot, in which, if he is interfered with in any way, and more especially if he is struck, he will wreak his vengeance on the offender; but he seldom goes out of his way to do a mischief, and will often pass through crowds of people without biting them; even if pursued and annoyed by cries and hootings, he takes no notice until he is injured, and then more frequently endeavours to escape into solitude than turns upon his assailants. As the

disease advances, the irritability increases, and the brain becomes excited to such an extent as to produce delirium, so that the dog evidently fancies that some unreal objects are surrounding him, and he bites at the wall or in the air. The strength is rapidly lost, and exhaustion or a convulsion puts an end to the life of the animal at the end of two or three days on the average. If, in any case, a dog is found to have the above symptoms, he should be carefully secluded in a safe place, and every precaution should be taken that he does not bite any living animal; but he should be suffered to remain in seclusion, so as to afford satisfactory evidence that he is mad, when he may be destroyed; or, on the other hand, to show that he is not, when of course he may at once be liberated.

CHAP. XVII.

CHRONIC DISEASES OF THE BLOOD, AND OF THE VESSELS WHICH CONTAIN IT.

SECT. 1.—PLETHORA.

387. It is very common to remark, in ordinary conversation, that an individual is very *plethoric*, by which it is understood that he is too full of blood, as shown by his red face, which is also full, and somewhat inclined to shine. This is termed in medical language *plethora;* and it appears to arise from a want of due proportion between the functions of nutrition and secretion, so that the blood is supplied with new materials faster than the old ones are removed, in the various processes going on in the body. For this reason, it is not common to meet with plethora to any extent in the hard-working artisan, or in the day-labourer, whose supplies of nourishment are seldom more than sufficient to meet the demand for new material; but it is confined to those who either eat and drink too much for the work which they do, or whose secreting organs are so inactive from disease as to refuse to carry off from the blood enough to keep it down to a healthy standard as to quantity. Muscular exercise is one main cause of waste of the blood, next to which perhaps ranks the employment of the mental faculties, and then the ordinary depurative secretions, or as they are often called, excretions, known as the bile, urine, and perspiration. The last of these is also mainly kept up to a natural quantity by exercise; and bile, as is well known, is generally secreted in proportion to the degree of active exercise taken, so that this seems to regulate the proper quantity of blood, either directly or indirectly. When the vessels are thus overloaded, or perhaps as a chief cause of their being so, the circulation is often languid, especially in the feet and legs, and there is a great tendency to passive congestion in all the internal organs. From this cause they are apt to be torpid; and hence it often happens that plethora is brought on in comparatively small eaters, because, though the nutrition is not above what it should be, yet the waste is still less, and the balance, however trifling, is still sufficient to overwhelm the blood-vessels, by a superabundant quantity of fluid. As a general rule, therefore, plethora may be considered as a want of balance between nutrition and secretion, which may be caused either by an excess of the former, or by a defective state of the latter, which is generally aggravated by want of exercise, and relieved by a proper amount of it.

388. PLETHORA is frequently attended, or indeed caused by a tendency to passive congestion, which prevents

the proper secretions going on, and thereby brings on or increases the fulness of the vessels. But independently of this, it also tends to produce congestion of important organs, such as the lungs and brain; or to hœmorrhage from mucous membranes, as those of the stomach, lungs, or bowels, or in the brain, ending in apoplexy; or to serous effusions of various kinds from congestion of these vessels. Indeed, there is scarcely any disease connected with congestion, and its constant attendant inflammation, which is not produced by plethora.

SECT. 2.—ANŒMIA AND CHLOROSIS.

389. ANŒMIA is nearly exactly the reverse of plethora, though it is more in the quality of the blood than in its quantity that a deficiency exists. It is in a diminution of the red globules that the disease consists, as well as in the other solid constituents, the whole quantity of fluid being sufficient, but of too watery a nature. Anœmia is far more common in the female sex than in man, though sometimes met with also in him. It is characterised by extreme paleness of the skin, especially visible where the cuticle is the thinnest, as in the lips and face, where it shows the hue of wax. Palpitation of the heart, fainting, dyspepsia, constipation, flatulence, and *pain in the side*, almost invariably attend this complaint. It may be caused,—1st, by confinement in dark rooms, or underground in mines; 2nd, by repeated losses of blood by hemorrhage, which may be external or internal; or, 3rd, by some deficiency in the supply of the solid materials necessary to its healthy composition, and which may depend either upon an improper quantity or quality of food, or upon a disorder of some or all of the organs which are required for its formation. This last condition, when it occurs in young persons, as it generally does, receives the name of *chlorosis* or *green sickness*.

390. ANŒMIA, from confinement in dark and ill-ventilated rooms, or in mines, does not commonly occur, except among miners, and those of the very poor who are obliged to bring up their children in the cellars of large cities, such as London and Liverpool. In this last case, bad food also co-operates in the production of the disease, which is evidenced by excessive paleness, a pasty condition of the skin, scrofulous affections, or rickets, and a general stunted appearance. In miners of adult age, the same symptoms sometimes occur, with palpitations, shortness of breath, perspiration on the slightest muscular exertion, and general loss of flesh. This form of anœmia seems to depend upon the want of fresh air and the healthy stimulus of *sunlight*.

391. ANŒMIA from loss of blood shows nearly the same symptoms as those indicated above, varying in intensity according to the continuation and extent of the bleeding. Regular, small losses of blood appear to be more prejudicial than the same quantity removed at two or three times, the nutritive powers not appearing to be roused to supply the loss unless there is a sudden shock produced, however slight it may be; and consequently the insidious removal of an ounce of blood daily, for a long period, by a few leeches, is more likely to be followed by anœmia than the same amount taken from the arm by the subtraction of a pint at a time. The immoderate discharge of any of the secretions will likewise produce anœmia, such as a too copious flow of urine, or milk in lactation, or of pus, or of mucus or watery motions from the bowels.

392. WHEN CHLOROSIS OR GREEN SICKNESS shows itself, there are some peculiar symptoms added to those which occur in either of the other forms of anœmia. It occurs chiefly in young girls, but sometimes shows itself in the adult, and even in married women, as well as, in rare cases, in the young and delicate of the male sex. In addition to the paleness of the skin common to all forms of anœmia, there are generally the following symptoms—namely, hysterical paroxysms, more or less violent nervousness on the slightest excitement, *depraved appetite*, headache

recurring at stated times, pain in the side, and very frequently swelling of the ankles. The progress of the disease is very gradual, nothing more than slight paleness and languor being observable for some months; but if inquiry is made, it will generally be found that there is constipation, loss of appetite which is also somewhat fickle in its impulses, occasional headache, palpitation, and pain in the left side. If these are neglected, they soon go on to such an extreme, that all ordinary exertion becomes laborious, and is followed by fainting, or palpitation, while the swelled legs, depraved appetite, and listlessness go on increasing in their prominence as individual symptoms. The headache and pain in the side are so severe as sometimes to occasion alarm; and numberless instances have occurred in which the mistake has been made of taking blood, or adopting other lowering measures, in the belief that the disease was of an inflammatory character. The secretions all go on, but are none of them healthy in character, and the monthly discharge is pale and diminished in quantity (if in excessive quantity, it may be the sole cause of the anœmic condition, which is then not chlorotic in its character, but depending upon the loss of blood, and not upon a defective supply of this fluid). The depraved appetite is very remarkable, and indicates the large share which the stomach has in the production of the disease. Cinders, chalk, slate-pencil, ink, vinegar, and a host of other absurd articles are eagerly sought for, and will be obtained if a strict watch is not kept upon the invalid, however trustworthy she may be in other respects; for the desire is so strong, and the mental control is so defective, from the low condition of the nervous system, that there is little chance of the latter keeping the former in subjection. The essence of chlorosis is undoubtedly a deficient supply of the red particles of the blood, and of the other solid ingredients, which is generaly caused by the sedentary habits of the young females of the middle and upper classes, or by the confinement of those who work in factories, &c., among the lower orders. Domestic servants are very subject to chlorosis from confinement to the house, after being brought up in a state of activity and exposure to the air and sun; and this is especially the case with those who leave a rural cottage in order to take service in the confined streets of a town, or city, where they often are kept within doors from Sunday to Sunday, and also underground.

SECT. 3.—CACHEXIA AND SCROFULA.

393. These two forms of disease are very closely allied, and can scarcely be separately considered with advantage. Indeed, scrofula may be said to be cachexia, occurring in young persons of a lymphatic temperament, while cachexia occurs chiefly in those who belong to the bilious temperament. In both there is a strong tendency to the formation of what is called tubercle, the nature of which will presently be described. Both are brought on by unwholesome food, want of fresh air, or by a damp and impure air, or, indeed, by any constantly acting, but slow, poison. An hereditary taint is very often concerned in producing the states which we term cachexia and scrofula; but of the exact nature of which we really know nothing, nor, indeed, are we able to do more than describe their most usual results. Tubercle is common to both, and may be deposited in the lungs, brain, liver, or bowels, as well as more rarely in other situations. Besides this, in scrofula, we find a long list of diseases, known as strumous ophthalmia; eruptions of various kinds, especially scall'd head; indolent, or, as they are called, scrofulous abscesses in the lymphatic glands; chronic disease of the joints, or of the spine, of a character known also as scrofulous; aud, also, scrofulous disease of the mesenteric glands. All these must, therefore, be here considered, except tho two first, which are included under *diseases of the eye* and those of the *skin.*

394. TUBERCLE is a pale yellow or yellowish-grey substance resembling curd, and of a consistence and form varying with the part in which it is

deposited, and the period of its existence at which it is examined. It is not an organized substance, and appears to be secreted in small particles of the size of millet-seeds by the vessels in the cellular tissue, or very generally either on or close beneath the different mucous membranes, as in the lungs, liver, and intestines. The form of tubercles is usually round, or nearly so, and when small, they are called *miliary*, But when deposited in tubes, as in those of the liver-ducts or other glands, the tubercle corresponds in shape with the interior of the tube which it fills. In its early stage, when it has increased in size, but while still resembling curd, it is called *crude* tubercle; but after a time, its presence generally causes inflammation of the tissue in which it is deposited, and this pouring out thin *pus*, as the ordinary result of that process, the cheesy matter becomes softened, and ultimately breaks down altogether. Thus it often happens that a number of crude tubercles remain dormant for a long time, but at last, from some accidental circumstance, their presence sets up inflammation, and then a quantity of pus is thrown out, which converts the whole mass into a complete honeycomb of cells filled with matter, or else a few may run together and form a regular cavity by the absorption of the intervening walls, which cavity is termed a *vomica*, when it exists in the lungs, or a scrofulous abscess elsewhere.

395. THE SCROFULOUS CONSTITUTION is indicated by certain external signs, which, however they may serve to put us on our guard, are by no means certainly attended with an outbreak of what is called *scrofula*. It is, therefore, only to be understood as indicating that, if the individual said to be included under this class, is mismanaged, it will most probably be afflicted with the symptoms known by this name, rather than by others of a different character. It may also be said that others besides those here described are subject to its attacks, for we sometimes see black-haired children submit to its power; but these are the exceptions, and as a rule, it will be found that children of a fair and transparent skin, with light silky hair, long shining eyelashes, and large blue, grey, or green eyes, with dilated pupils, will be the most likely to become scrofulous, especially if they have a delicate pink on the cheeks, contrasting with a pure white on the rest of the face. In such children the slightest irritation produces inflammation and fever, and even a coarser soap than usual will often irritate the skin to a painful degree. They usually cut their teeth badly, but sometimes this process is gone through without difficulty, although soon followed by an outbreak. In addition, there is usually a large head with a full and round forehead, and in general a precocity of intellect, which, however, soon fails when put to the test, and the mind is seldom capable of much application. Such is the state of the scrofulous constitution when comparatively healthy; but when disease is about to show itself, the colour leaves the cheeks in great measure, and they become doughy and white, the upper lip thickens and becomes red, almost completely eclipsing the under lip in size, at the same time the eyelids often look red, and their veins are unusually apparent; the abdomen is prominent, and the appetite either depraved so as to crave for all sorts of improper articles of food, or else it is almost lost; the hair becomes rough and dead, and the ends are very apt to split; chilblains show themselves on the slightest change to cold from a warm temperature, and the body loses flesh by slow degrees. When these symptoms are fully developed, it may be suspected, with some degree of certainty, that there is a large deposit of tuberculous matter in some organ of the body, and by a careful examination it will generally be detected by the local symptoms which betray its presence. If any of the lymphatic glands, or the joints, are affected, the disease shows itself externally; and we have an inflammation of the glands of the neck, extending downwards from the ear to the collar-bone, though the enlargement of these is not necessarily scrofula, as they

sometimes inflame from cold in a weakly subject. If, however, they gradually increase in size, and, in spite of good management, they persist in softening, and discharge a thin watery fluid, mixed with curdy matter, it may safely be asserted that scrofula is present. The same may be said of disease of the joints in children, which may possibly belong to other divisions besides the one we are now considering; nevertheless, a slow enlargement of the knee-joint, followed by ulceration of its cartilages, is pretty certain to be of this nature. Independently of these external outbreaks, there are three chief seats of scrofula, namely, the brain, the lungs, and the glands of the intestines *(mesenteric)*; and, generally speaking, when a slow and insidious disease appears in either of these three organs, in a child of the character described above, it will ultimately be found that there is tubercle deposited there. Of these the most common is *tubercular phthisis*, generally known as *pulmonary consumption* or *decline*, while scrofulous disease of the mesenteric glands receives the name of *atrophy*, and tubercular deposit in the *brain* falls under the comprehensive title *hydrocephalus*.

396. PHTHISIS OR CONSUMPTION (by which latter name the disease is too familiarly known to most families residing within the British Isles), may be known by the following symptoms, as soon as the presence of tubercles irritates the lungs, so as to establish inflammation. Prior to that stage it requires the skill and experience of the educated physician to detect the presence of tubercles; by whom they may almost always be discovered if they exist in such quantity as to occupy any considerable amount of the substance of the lung; but it is beyond the power of science or art to detect, with any certainty, the presence of a small number of tubercles in the lungs, in a state of quiescence, and for this reason, in spite of every precaution, many lives are passed by the medical examiners at our insurance offices, which are soon destroyed by the breaking out of inflammation in the lungs, caused by a small number of tubercles in them. Perhaps this is a kind dispensation of Providence, as the proportion of those who have tubercles deposited in their lungs, is so great as to occasion alarm in most families, if it were known; and possibly, by the nursing and over-anxiety which it would occasion, the disease, instead of being warded off, might only be the more surely brought on. The chief and most prominent sign of consumption is *cough*, which at first is usually slight and dry, occurring mostly in the morning when getting out of bed, and appearing to the patient to be "chiefly in his throat." This often goes on for many weeks, or months without any expectoration, or perhaps a very small quantity of frothy fluid, mixed with a few specks of yellowish white matter. The cough becomes gradually more frequent, and occurs after any slight exertion, such as running up stairs. It is also very troublesome towards night, and generally keeps the patient awake for some time after getting into bed. The breathing, at first unaffected, gradually becomes short and quick, and the quantity of air which can be inspired diminishes in a ratio with the advance of the disease. It will generally be found that, in consumptive persons, the chest is narrow and incapable of a very full dilatation; but as soon as tubercles are deposited in any quantity, and still more when they have caused inflammation to any extent, the quantity of air inspired is very small indeed. A practised hand will almost immediately detect this condition when placed upon the chest. The patient attempts to inspire deeply, but if there is any great extent of tuberculous deposit, the ribs continue immoveable, and the hand is scarcely raised at all, although the muscles of respiration are seen and felt to exert themselves to the uttermost. When this state of the chest is met with in a person of scrofulous appearance, with a chronic cough of the kind just described, there is every reason to fear that tuberculous deposit exists in the lungs, and no time should be lost in ascertaining the truth or fallacy of the supposition. It is, however, only in the later stages that this excessive want

of dilatation of the chest marks the consumptive cough, as it may exist with a very slight extent of disease in the lungs; and in such a case, it is somewhat difficult to distinguish the cough of tubercular disease from that of ordinary chronic bronchitis, or of that species which is known as "stomach cough," from being an extension of gastric irritation. The gradual advent of the phthisical cough is its most peculiar symptom, whereas ordinary bronchitis generally comes on suddenly, and is more sonorous. The cough of consumption well deserves the name of "hacking," which is so often given to it. In the stomach-cough the presence of dyspeptic symptoms will also serve as some guide, and the tongue is generally red and shining at the tip, and often crossed with deep furrows or cracks. The bowels, also, are constipated, and headache is often present, with cold extremities, and a general aspect of bad health. Tubercular cough may be aggravated by cold, so as to assume the form of bronchitis; but when the attack of this latter goes off, it will leave it as before; and in the same way there may be, and often is, a complication of stomach-cough with phthisis, which renders the diagnosis more difficult. Next to the cough, the most prominent symptom is the difficulty or shortness of breathing, which at first trifling, becomes gradually more troublesome, and at last is so distressing, that it is impossible to lie down, so that the patient is obliged to be propped up in the bed night and day. The *pulse* is by no means a good criterion of the presence of tubercles, as it is often not at all affected by them, until the disease has gone on to an irreparable extent; but if the pulse is very quick, and at the same time the existence of tubercle is discovered or suspected, the progress of the disease will be almost surely very rapid, and its amenability to remedial agents comparatively small. The *fever* which attends phthisis seldom comes on in the first onset; and when it does make its appearance, it is by slow and almost insensible degrees, though it is true that occasionally we see the contrary occur when hectic fever is rapidly established, as in what is called a "galloping consumption." At first, there is only a slight chilliness towards the evening, then a shivering will be felt, but scarcely amounting to more than what by some is called a "creeping," and by others a "dither." Soon afterwards, there will be an occasional flush, and then, as the disease advances, hectic fever, as described at page 30, will be fully developed. By this time morning *perspirations* will always show themselves, at first slight, but soon to such an extent as to saturate the night clothes. When these occur *thirst* accompanies them, mainly owing to the quantity of fluid which they carry off from the circulation. The body slowly becomes emaciated, the progress of this and most of the other symptoms being just as much regulated by the powers of the stomach in affording fresh nutritive matter, as by the extent of the disease in draining it from the blood. Towards the last, there are two complications that are mainly instrumental in hastening the fatal result, and these are *hæmoptysis*, or bleeding from the lungs, and the form of diarrhœa which is called colliquative. The hœmoptysis may be slight or abundant, and it may be the result of congestion in the vessels of the bronchial tubes, or it may arise from an actual breaking down of a blood-vessel as it crosses a *vomica*. In the first of these cases, the bleeding generally occurs in the early or middle stage of consumption; and very often it may make its appearance without any serious mischief having as yet taken place, so that the mere bleeding from the lungs, although in itself sufficiently alarming, is not necessarily to be considered as a fatal symptom. Nor is the quantity of blood lost any criterion of the extent of the mischief causing it, as, on the contrary, it will often be found that, *at first*, in consumptive cases, the amount brought up by expectoration is very trifling, and it is only in the last stages that a "broken blood-vessel" pours out sufficient blood to cause an immediately fatal result.

397. NATURE, DIAGNOSIS, AND DURATION.—From the foregoing remarks, it

may be gathered that the essence of the disease consists of a slow inflammation of the lungs, caused by the presence of tubercles, and going on to produce extensive destruction of their substance by ulceration, so as to soften the tubercular deposit, and expectorate it in the form of a glairy fluid, with lumps of viscid yellow matter suspended in it. The quantity of this discharge causes a great drain on the system, whilst the destruction of so vital an organ, joined to it, sets up hectic fever, with its attendant perspiration and diarrhœa, and all conspire to reduce the bulk and strength of the patient. It may be *distinguished* from chronic bronchitis or pneumonia, with which alone it is liable to be confounded, by the symptoms above enumerated, and by the evidence of the stethoscope, as well as of percussion by the hand; but these only afford indications to those who have studied their use. The character of the expectoration is, to a certain extent, a means of diagnosis, but liable to great uncertainty occasionally. In the early stages of phthisis, the *sputa* (as the expectorated matter is called) are opaque and yellowish-white, and can then scarcely be distinguished from those of ordinary bronchitis; but when fully established, they become quite yellow, *and, as a rule, sink in water*. They also often look curdy, and contain small streaks or clots of blood. If they resemble flocculent masses of wool, and still sink in water, and especially if at the same time they are of a greenish cast, there is little doubt of their tubercular character. The average *duration* of consumption in this country is from eighteen months to two years, the least time being about three weeks, and the utmost being scarcely to be measured except by the duration of man's life, as many have lived through half a century with evident traces of this disease, and have at last succumbed. It is undoubtedly hereditary, and there is every reason to suppose that many are born with tubercles, and retain them in a quiescent state for many years, as they are found at all ages in the lungs of those who die of other diseases.

398. **Atrophy**, or *scrofulous disease of the mesenteric glands* (sometimes also called *marasmus*, and by the modern nosologists, *tabes mesenterica*), consists in a chronic enlargement of the mesenteric glands, accompanied with a gradually increasing emaciation, and ending in hectic fever. It is known by a hard and swelled abdomen, contrasting forcibly with wasted limbs, and a pallid, drawn, countenance, which is so marked in its expression as to be easily recognised by the least skilled observer of disease. It is generally confined to children under ten years of age, and scrofulous constitutions are peculiarly liable to it. As in tubercles of the lungs, so here, the deposit may exist in the glands for a long time without exciting inflammation; but as they are situated in the course of the lacteal vessels which absorb food, they interfere with that process from the first, and produce emaciation in proportion to their numbers and size. It will thus appear that an unnatural want of flesh is the first symptom to be noticed, the next being a great fulness of the abdomen, which at the same time gives a sensation of hardness very different from the flatulent feeling communicated in mere dyspepsia. This constitutes the early or indolent stage of mesenteric disease; but after a time, the presence of the tubercular matter stirs up inflammation in the surrounding structures, and ulceration goes on in the same way as described in pulmonary consumption, the tubercles becoming soft, and forming collections of scrofulous matter between the folds of the peritoneum, followed by still increasing emaciation, fever, and death. There are lancinating pains felt in the abdomen, which resemble ordinary griping, and they recur at intervals of a few hours, almost every day. The evacuations are generally of a peculiar white colour, resembling chalk, and worms are often present. Disease of the mesenteric glands is not readily distinguished from other chronic affections of the bowels in the early stage, but afterwards there is seldom much difficulty. If, however, even in the first stage, a child of a scrofulous con-

stitution wastes away very gradually, still retaining a good appetite, and without any other apparent cause, the case may generally be referred to the disease which is now under consideration.

399. TUBERCLES IN THE BRAIN produce symptoms too obscure to be any guide to the ordinary observer of disease. Sometimes the cheesy matter is collected in round masses, varying from the size of a pin's-head to that of a large marble, and being found in all parts of the brain, as well as the spinal cord. There is every reason to believe that it often precedes water in the head, but of this it is not easy to bring absolute proof. Many cases, however, end fatally, attended with convulsions, squinting, &c., in which no water is effused.

400. SCROFULOUS ULCERS OR SORES may arise in debilitated subjects from any cause which breaks the surface of the skin; but they are generally the remains of abscesses which have partially closed, leaving a superficial sore, which is of too indolent and unhealthy a character to heal. Hence, when they do ultimately heal over, there is very generally a puckering of the skin, with a partial indentation, owing to the absence of healthy granulation to supply the place of the lost cellular membrane, and the scar is ugly, and so marked in character as to be readily detected. The true scrofulous sore, when open, is known by its pale thin edge, which is generally everted, instead of being drawn towards the opposite side, as in a healthy and healing sore. There is sometimes a hardened base, from lymph being thrown out, but then the granulations are pale and flabby, and there is no tendency to heal.

401. SCROFULOUS DISEASE OF THE LYMPHATIC GLANDS is described at page 110.

402. SCROFULOUS DISEASE OF THE BONES AND JOINTS is always of a chronic character, and attacks the ligaments and cartilages of the joints, with a tendency to ulceration, or the spongy ends of the bones, with a disposition to end in caries. Sometimes there is a concurrence of all three when a joint is attacked, and then there is not only ulceration of the cartilages and ligaments, but also caries of the head of the bone, as is often seen in the knee and ankle-joints of scrofulous children.

403. CARIES OF THE HEAD OF A BONE is not uncommon among scrofulous children, and causes the ulceration of the cartilage covering it, the matter pouring into the joint, and causing it to swell, and ultimately to give vent to it, by external ulceration of the synovial capsule and skin. This disease most commonly attacks the knee, elbow, and wrist, as well as the ankle, and is very common in scrofulous young people before the age of twenty-five. In these cases there is a fixed dull pain in the joint, aggravated by motion, and at first without much swelling, but as the disease progresses the joint becomes filled with matter, and ultimately bursts. This disease of the joints may be distinguished from rheumatic inflammation by the severe pain which attends it, and by the swelling not coming on till the pain has existed for some time. When the cartilages alone are attacked by scrofulous ulceration, the pain is very severe; but in mere caries of the head of the bone, it is not a very marked symptom. After all, the appearance of the patient is the best test.

404. SCROFULOUS DISEASE OF THE HIP-JOINT is very common in young people, and first shows itself by occasional pains, with more or less stiffness and lameness in walking. As the disease progresses the pain becomes intense, especially if the cartilage is ulcerating; for if the bone is carious, it may not be very distressing, and is sometimes almost entirely absent. In either case it is referred to the knee, which is complained of by the patient as the supposed seat of the disease; but if the knee itself is handled without moving the hip-joint, no increase of pain is given; while, on the other hand, if the hip itself is jarred by pressure on its exterior, or by striking the bottom of the foot, great pain is communicated to the knee, which still seems to be the seat of the complaint, as far as the sensations are concerned. After a time the buttock wastes, and

the thigh looks like a stick towards the lower part, while the outside of the hip swells and loses its ordinary *contour.* Generally in the early stage the affected limb lengthens slightly, apparently from being forced out of its socket by a collection of matter; but towards the last the opposite result is observed, and the diseased leg is considerably shorter, in consequence of the destruction of the socket, and the muscles of the limb drawing the thigh-bone upwards. In very bad cases the matter formed by the diseased cartilage or bone finds its way to the surface, forming one or more abscesses which break, leaving long *sinuses* leading inwards toward the original disease, and giving vent to the unhealthy and scrofulous matter, which is secreted from the ulcerating surfaces.

405. Psoas Abscess and Lumbar Abscess are two forms of scrofulous abscess, which occur from inflammation of the spinal bones, or sometimes of the cellular membrane only. In psoas abscess the matter passes downwards behind the abdomen, and shows itself in the lower part of the groin, where it may be felt as a fluctuating tumour. In lumbar abscess, it is formed in the lower part of the back or loins, where it appears as a large soft swelling giving the feeling of fluctuation, and often occasioning very little local disturbance, further than that kind of uneasiness which always accompanies any disease of the spine.

406. Spinal Disease occurs almost invariably in scrofulous constitutions, and may consist either in distortion from mere debility of the bones, ligaments, and muscles, or in the worst cases from absolute caries of the bodies of the bones. In the first case the bones may give way from being deficient in lime as in *rickets*, or from that extraordinary soft condition which is known by the name of *mollities ossium;* or, from the greater weakness of one set of muscles than of their antagonistic set, the back may be drawn in any direction. It is very important towards the selection of an appropriate remedy, that these several conditions should be clearly made out.

407. Curvature from Rickets is seldom a solitary symptom of that disease, but is accompanied by bow-legs, or buck-shins, which at once show its nature. In this kind of curvature the back may be bent in any direction, either laterally or forwards, or backwards even in some rare cases.

408. Curvature from Weakness of the Muscles and Ligaments is most frequently lateral, and the back makes a double bend in that case, in order to restore the head to its erect position. There is seldom much pain attending this kind of curvature, and the mother's attention is only drawn to it from the deformity which she sees in the figure of the child. In examining such a curvature of the spine, it is found that there is a projection of one shoulder which is most commonly the right, and the inexperienced mother is apt to fancy that the fault is confined to that part, and concludes that her child's shoulder is "growing out;" and that by paying attention to keeping it down, she shall succeed in stopping the progress of the deformity. But, if the back is carefully examined, it will at once be seen that the shoulder is made to project, because that side of the chest is rendered prominent by a curvature of the spine, having the inside of its bend towards the left side. When this is the case, if the spine is traced downwards, it will still further appear that another curvature exists in the loins, but with its concavity towards the right side; and as this part of the spine is attached to the pelvis, it compels in this instance a prominence of the left hip. All this may not readily be seen by those who are not accustomed to the task of examining the human form; but it will be rendered more apparent if the patient is made to stand quite upright with both feet together, and the arms crossed equally in front of the chest, while, at the same time, the eyes are kept looking straight forward. To those who are not very skilful in this examination, a line of ink made along the line of the bones of the spine, will sometimes afford assistance, and by its aid the

most inexperienced can scarcely fail to see the nature of a lateral curvature if it exists. In some cases the left shoulder projects, and then the two curvatures are the reverse of those above described, and the right hip is the most prominent. This kind of curvature is mainly caused by those modern occupations and positions which are maintained in young girls as a part of their education, without a due regard to that amount of exercise in the open air which will brace their muscles and ligaments. By the errors of the last generation there is already too great a delicacy of constitution implanted in our young females; and if great care is not taken to avoid increasing the mischief by keeping the spine on the stretch, this form of curvature is almost sure to arise. Tight stays, especially if ill-made, are also a very common source of the disease, which they produce by compressing the muscles of the spine, and by preventing their healthy action. But the chief cause is the long-continued maintenance of the erect posture, *as far as the back is concerned*, either when standing or sitting. In this position the muscles of the back become dreadfully tired, and at the same time miss the alternate stimulus and relaxation which occur during walking, when in each successive step one set is contracted and then immediately relaxed. But when erect in the high-backed chair of our ladies' schools or private school-rooms, or when standing for the purpose of class-exhibition, the upper part of the body is to a great extent only balanced on the spine, and this is done first on one hip and then on the other, as each set of ligaments in turn becomes fatigued. If a girl is carefully watched as she thus sits apparently upright, she will be found to be instinctively varying her position, and bearing her weight at all times more on one hip than the other; and the same thing occurs in standing if long-continued, when, if the feet are watched, it will be seen that they seldom both take an equal share of the weight, and if they do not, it follows as a matter of course that the spine at that moment must be out of the straight line, and one hip is more prominent than the other. If this continues, there is always a favoured side, and, as a consequence, a permanent curvature, which rapidly increases from the moment of its being established, partly by the action of the muscles, which are drawn across the inside of each bow, and partly by the weight of the upper parts of the body. In addition to these causes, the elastic substance between the bones of the back is said to be compressed on the one side more than the other, and so to increase the deformity; but of this I have strong doubts as a *cause* of curvature, and believe it is only the *effect* of the disease when it has existed for some length of time.

409. CURVATURE FROM CARIES of the bones of the spine is always angular, and causes a pointed projection backwards in most cases, from the bodies of these bones being the parts which are diseased; and as they gradually give way while the posterior processes remain entire, a projection is formed which cannot well be called a *curve*. At first, the pain in the back is not great, and in children especially it is not complained of; but the first symptom observed is an incapability of making any exertion without pain and consequent lassitude, and very often coldness or numbness of the legs, or even twitchings or spasms. These are, finally, followed by paralysis of the lower limbs, and of the bladder and rectum as well, and the patient lies helplessly on the back or side until nature either unites the bones by anchylosis (par. 292), or else the spinal cord is so pressed upon that death ensues; or in some cases, extensive sloughs of the skin form from the pressure of the body, and exhaust the strength; or finally, abscesses connected with the bone make their appearance (see *psoas and lumbar abscess*).

SECT. 4.—CHRONIC DISEASES OF THE BLOOD-VESSELS.

410. Besides the active diseases of the arteries and veins connected with inflammation or congestion or both together and called respectively *arte-*

ritis and *phlebitis*, there are also several chronic affections, which are either congenital defects in their structure, or dependent upon an inherent or acquired weakness in their coats. It has not been thought desirable to describe either of the two active inflammations mentioned above, because they are not very commonly met with; and if they do occur, they are not calculated for domestic treatment, but some of the chronic affections are of that kind, that they demand constant supervision and care to prevent the risk of fatal mischief, or at all events to postpone its arrival. Here it is imperatively necessary that some person should be fully impressed with the importance of the task, and of course he will be more likely to acquire this feeling, if his judgment is convinced of its necessity, which it will be if he is instructed on the nature of the case. It is seldom desirable that the patient should be aware of his state in these cases, as the anxiety attending on the full knowledge of the danger of the disease to which he is a martyr will generally defeat the purpose for which care is required—namely, the constant tranquillity of body and mind. The three chief divisions under which this subject falls are—1st, *chronic diseases of arteries*; 2nd, *chronic diseases of veins*; 3rd, *chronic diseases of the heart*; and 4th, *hemorrhage*.

SUB-SECT. A.—CHRONIC DISEASES OF ARTERIES.

411. A DEGENERATION OF THE COATS of arteries is a very common cause of their rupture, and it may be either of a cartilaginous nature, or of a cheesy character, consisting of fat granules; or lastly, of a deposit of a calcareous or earthy substance in their coats, in which case the artery affected in this way is commonly said to be "ossified." It is from one or other of these degenerations that the valves of the heart become diseased, so as to act imperfectly, and allow of the regurgitation of the blood through them.

412. ANEURISM is a gradual dilatation of the coats of an artery, by which a hollow membranous bag is formed on one side or around it, and communicating with the interior, so as to receive the blood passing through it. These bags may occur in any part of the course of an artery, and may either be formed by an extension of the coats of the vessel itself (*the true aneurism*), or by the addition of a new membrane, the result of inflammation, in which case the tumour caused by the escape of blood from the vessel is called a *false aneurism*. The latter is generally caused by an accidental puncture of an artery, as in the operation of bleeding at the bend of the arm. In addition to these two varieties, there are also the following:—1st, *the aneurismal varix*, when an artery is punctured through a vein, and the communication is kept up between them by the edges of the openings uniting together, so as to allow the arterial blood to flow through it into the vein; 2nd, *varicose aneurism* is said to exist when this same accident has happened, but instead of the two openings uniting directly together, they have a membranous sac or bag of lymph between them, but still allowing the blood of the artery to enter the vein; and, 3rd, *aneurism by anastomosis*, in which several large and tortuous arteries and veins, whose coats are excessively thin, are united together to form a tumour, such as is often seen on the temple, or any part of the head, face, or neck, and which is one form of *nævus* or *mother's mark*.

413. TRUE ANEURISM seldom occurs, excepting in connection with the largest arteries, such as the aorta, and the great branches springing directly from it. The tumours formed in these cases are large and pulsating; and when they are in the limbs, so as to be reached by the hand, they may be partially emptied of their blood by pressure on the vessel nearer the heart, but fill again directly it is removed. A part of their contents is generally coagulated blood, which has become firm, and cannot therefore be pressed out, but the fluid blood in them is easily squeezed into the vessel with which they communicate. As long as these aneurisms are small, they give little or no pain or inconvenience; but as they enlarge, they are so situated near

the large nerves or other important parts, that they often occasion severe pain, and even lead to the absorption of bone, when they lie for any length of time upon it, as in the case of aneurism of the aorta, as it passes by the side of the spine, where it often has been known to produce caries. Besides these consequences of large aneurism, they ultimately end in rupture of their coats; and almost always this takes place when the tumour is near the skin, on the side towards the surface, so as to occasion an enormous flow of blood externally, and generally to end fatally in a few minutes. If, however, the aneurism is deep among the internal organs of the body, as in the chest or abdomen, where the aorta lies behind the lungs and intestines, in its course downwards, and a rupture takes place, the opening may be in any direction, and the blood is poured out accordingly, either into the pleura or peritoneum; or sometimes the sac communicates by ulceration with the bronchial tubes; or even with the interior of the stomach or intestines; in which cases, if rupture takes place, the blood is poured out into the mouth, or it flows downwards by the anal aperture. One of the most common varieties of aneurism is met with in the upper part of the chest, and arises either from the aorta before it has turned downwards, or from some one of its large ascending branches. In these cases the tumour is formed high up in the chest, and often causes a caries of the breast-bone, or absorption of the cartilages of the ribs, or appears in the spaces which are left between the ribs, and bursts outwardly by ulceration of the skin. Here a large pulsating tumour must have existed in the front of the chest for some time prior to the rupture, and both the patient and the friends, as well as the medical attendants, must have been prepared for the fatal result; but in aneurism of the same artery (the aorta) lower down, the disease may go on to its final state of rupture, without having been detected, especially if there has never been a careful examination made by a competent physician, and even then it may have escaped his notice, as has happened on several occasions. Generally, however, the stethoscope detects the presence of a large aneurism, by a peculiar sound which the blood gives as it passes into the sac. Independently of these internal sites of aneurism, the most common are in the neck, where the carotid artery, or that leading to the arm on each side, as it passes out of the chest, becomes dilated, and there is a pulsating tumour just above the collar-bone, or between that part and the ear; or it may exist at the groin or behind the knee, in the space called popliteal, and the aneurism which so commonly occurs there is, therefore, called *popliteal aneurism.* If, therefore, in either of these situations a pulsating tumour is found to exist, which is capable of being partially emptied by pressure on it, and on the artery just above it, the sooner the advice of a good surgeon is obtained the better, for life is never safe while such a tumour remains uncured, and in many cases *a cure can be effected.*

414. VARICOSE ANEURISM and ANEURISMAL VARIX, as well as FALSE ANEURISM, are almost always the result of accident, and are sure to be examined by a surgeon competent to give proper advice.

415. ANEURISM BY ANASTOMOSIS AND NŒVUS constitute those purple-coloured soft tumours generally congenital, which begin with a small spider-like mark on some part of the body, and gradually increase in size until they sometimes reach the dimensions of a saucer or small plate. Occasionally these tumours show themselves for the first time after birth, but in most instances some evidence is presented to the experienced eye of what is to be expected. It may be a little "grape," or a "spider," or a "currant," but almost always there is a stain of the skin occasioned by enlarged vessels, and these may remain quiescent during the whole of life; or at other times there is no change for some years, and then all at once the vessels set on to dilate and grow, and that which had previously been scarcely noticed assumes an angry and threatening character. At length they become so full of blood,

and the coats of the vessels, as well as the skin over them, are so thin, that they ulcerate, and a gush of blood is poured out, which is dangerous to life if not soon stopped by pressure.

SUB-SECT. B.—CHRONIC DISEASE OF VEINS.

416. BY VARIX OR VARICOSE VEINS is meant an enlargement of the superficial veins, accompanied with an obliteration of their valves, in consequence of the increased size of the canal. From this last cause the veins, having to sustain the whole column of blood, become unnaturally tortuous, and their coats are thickened irregularly, being in places often so thin that they burst either from their want of strength sufficient to sustain the column of blood under peculiar circumstances, or by ulceration as a result of inflammation. Varix is generally caused by pressure on the large veins above the seat of the disease, as in pregnancy or congestion of the liver, or it may be owing to a natural weakness of their coats. It is very apt to lead to the formation of ulcers of a peculiarly obstinate character, when the veins of the legs are varicose, and sometimes hemorrhage to a frightful extent takes place. The veins of the legs and the spermatic vein are those most frequently rendered varicose, the latter being the seat of the disease called *varicocele.*

417. HEMORRHOIDS OR PILES are small varicose tumours, situated either within, or close on the outside of, the anus. They consist in a varicose enlargement of the veins, which are situated around the rectum, and these forming little knots, are still further enlarged by the pressure of the contracting muscle (*sphincter ani*), which impedes the return of blood from them—that is to say, when they are external to it. After a time, their coats and the mucous membrane of the bowel covering them inflame; and this appears to be chiefly caused by the blood stagnating in them, and thereby acting as a foreign body. Lymph is often thrown out in addition, in which cases little hard lumps are felt floating loosely in the comparatively soft tumour, consisting of half coagulated blood. Piles are called *internal* when they are confined to the parts of the bowels inside the sphincter ani, or *external* when they protrude beyond it. *Internal piles* vary in size, from that of a pea to that of a bantam's egg. They may be few in number, or they may occupy the whole of the interior of the bowel for three or four inches from the orifice. If inflamed they are of a bright red, but otherwise they are blue or brownish red in colour. If indolent they give little pain; but, on the other hand, they are often so inflamed and irritable as to occasion excruciating agony, and the mucous membrane covering them becoming ulcerated, the enlarged veins give way, causing extensive hemorrhage after each motion, or in bad cases on the slightest exertion. Sometimes they are rendered prominent externally by straining, but at others they never show themselves at all. *External piles* are similar in structure and appearance to internal piles, except that their covering is more nearly allied to skin than to mucous membrane. When recent they are soft and tender, and may be emptied of their blood by pressure; but, after being constricted for a few hours by the sphincter ani pinching them, their blood becomes coagulated, and they are firm and incompressible, but even still more painful than at first, from the establishment of inflammation; indeed the agony they occasion is often extreme. After a few days, however, the inflammation generally subsides, and the blood is absorbed, the pile, as a consequence of this, shrinking into a fold of skin, which is then called a "blind pile," but only wants a repetition of the cause to be again filled with blood. Both kinds of piles are the result of passive congestion in the veins surrounding the rectum (*hemorrhoidal veins*), and this is generally produced by an impediment in the return of the venous blood through the liver, which, as described at par. 294, is supplied from the veins of the intestines. Hence it follows that if the liver is

gorged with blood, the veins supplying it must also be in the same condition; and so we find that hemorrhoids are generally found in those who have torpid livers. But, in addition to this congestion of the hemorrhoidal veins, which is necessary to the production of piles, habitual constipation greatly aggravates them; and it may generally be assumed that the two must co-exist, in order to develop piles to any great extent. As, however, torpidity of the liver is generally followed by constipation from the want of a proper quantity of bile, this additional cause is seldom absent, and piles will, in most cases, be found when torpidity of the liver co-exists with constipation, their extent being in great measure dependent upon the amount of torpidity, and also upon the bad or good management in other respects of the patient himself.

418. THE EXISTENCE OF PILES may be known by the following symptoms: When *indolent* and *internal*, there is merely a sensation of fulness within the bowel, and a feeling of not having fully relieved it in the ordinary daily evacuations. If *inflamed*, however, there is pain in addition to the fulness, with heat and itching, and often bleeding. Sometimes there is irritation of the bladder, pain in the back and down the thighs, and in very bad cases, the pain seems to extend upwards for a considerable distance along the spine, and is described as being like a red-hot poker passed up the bowel. If the piles are external, they make themselves known by their bulk, and by the pain and soreness which they occasion, so that there is no chance of their being mistaken for any other disease; but internal piles are often in existence for months or years, and occasion great discomfort, and sometimes very curious sympathetic pains, without the patient being aware of their existence. Bleeding also from piles may occur, and for a long time too, without the patient having made the discovery, as the blood may have been concealed in the water-closet; but this does not often happen, and the first appearance of blood is usually the means of the sufferer from piles finding out the nature of his complaint, if he has not previously been aware of it.

SUB-SECT. C.—CHRONIC DISEASES OF THE HEART.

419. FUNCTIONAL DISEASES OF THE HEART, as distinguished from organic affections, are very common among delicate and what are called nervous people, and depend upon some obscure defect in the heart itself or its nerves, which we cannot discover by our senses, or upon some similar undiscoverable disorder elsewhere, as in the liver or lungs, both of which are so intimately concerned with the healthy action of the heart, as to influence it either for good or ill. Of these, *palpitation* is the most frequent and consists in a strong, quick, and tumultuous pulsation of the heart, coming on in paroxysms, and not attended, as far as we know, by any organic lesion. Sometimes the feeling of distress is great when the palpitation comes on; but very often the patient is almost unconscious of its presence from being so accustomed to it. This kind of palpitation is very often connected with dyspepsia, and makes its appearance after every full meal. It also occurs in weakly and irritable persons on the slightest exertion, such as running up stairs, and may possibly be due to the heart being so feeble as to be incapable of carrying on the circulation, when called upon without extra stimulus which is then continued after it is no longer required. *Angina pectoris* is supposed to be connected with some obscure nervous affection of the heart, and is marked by a sudden and violent pain across the chest, extending down the arms, and apparently threatening immediate death from its severity. It often comes on when the patient is at rest, but generally shows itself directly after a violent exertion, such as running up hill or the like. The paroxysm does not often last long, but in a few instances it has been known to persist for an hour or two. Of its exact nature and cause we know nothing. *Syncope or fainting*, though having its seat in the heart as the organ which first fails, is really an

affection of the brain produced by this cause, and as such is described at page 118. *An intermission in the action* of the heart is not an uncommon *functional* affection, though generally dependent upon organic disease. Where it is only occasional, it most probably depends upon some temporary defect in the return of blood by the large veins, as in congestion of the liver or lungs.

420. CHRONIC ORGANIC DISEASES OF THE HEART may be either the result of inflammation of the pericardium, or the heart itself, or they may depend upon original malformation, or upon dilatation, or hypertrophy of its walls, or lastly, upon disease of its valves.

421. THE SYMPTOMS of disease of the heart vary according to the nature of the mischief, and may be either an excessive blueness of the lips and face, without much difficulty of breathing, or a constantly intermitting pulse, or an excessive action of the heart, with or without corresponding increase of the power of the pulse, or besides these, various unnatural sounds which may be heard by applying the ear to the chest, and which are denominated "*bruits*," but which require a practised ear, and the aid of the stethoscope to make any use of in diagnosis. There is almost always a peculiar feeling of anxiety in disease of the heart, but this is not an invariable rule; and I have known some cases continue for years without the slightest distress of this kind. Beyond the above general characteristics of this disease, it is useless to attempt to give any information to the general reader. The causes of these affections are numerous; but very often they will be found to arise from inflammation of a rheumatic character, attacking this organ, and leaving it enfeebled, while the patient has persisted in using it to an improper extent, before it has recovered its healthy action. Of the cause of the diseased deposits in the valves, we know nothing, nor of the curious malformations which sometimes occur.

SUB-SECT. D.—HEMORRHAGE.

422. HEMORRHAGE, strictly speaking, is more a symptom of some other disease than a disease of itself; but sometimes, though still a symptom, it is the prominent one in a general condition of the vessels, in which their power of contraction when divided seems to be so small as to be useless in stopping the flow of blood. Under such circumstances, a *hemorrhagic diathesis* is said to prevail; and the danger in case of a wound, however slight, is very great. Many have died after the drawing of a tooth, and a bleeding of the nose has been fatal in numberless cases. This diathesis must, therefore, always be borne in mind in estimating the degree of danger in any particular case of bleeding, either from a cut or torn set of vessels, or from an oozing mucous surface.

423. WHEN HEMORRHAGE occurs from a wounded vessel of any size, the mischief is either accidental, or it is the result of the surgeon's knife. It is, therefore, needless to describe the nature of it, or to dilate upon the various kinds of injury, or the operations which may require the staunching of the flow of blood.

424. HEMORRHAGE FROM DISEASE may be divided into—1st, those which arise from an excessive action of the heart and arteries, and is hence called *active;* 2nd, those of which debility of the small vessels is the essential feature, and are thence called *passive;* 3rd, hemorrhage from congestion in the small vessels, and thence called *congestive;* and, 4th, hemorrhage from ulceration through the coats of large arteries and veins, which is known by the name of a "broken blood-vessel," though this is often ignorantly applied to extensive hemorrhages from other causes. The three first kinds occur chiefly from the vessels of the mucous membrane, either of the stomach, bowels, lungs, kidney, or bladder, and, in such cases, whether the small vessels are in fault or the heart is inactive, the flow of blood is from the minute veins and arteries. But, in the fourth instance, a very large artery, or vein, may be opened by ulceration, as in the case of a blood-vessel exposed by vomica in the lungs, or an aneurism bursting, or a varicose vein giving way.

425. HEMATEMESIS, or a *vomiting of blood*, may be known by the black and liver-like appearance of the blood, or by its resembling coffee-grounds, and it is not coughed up, but vomited. It is sometimes merely a symptom of general plethora, but very often depends upon organic mischief in the stomach, or adjacent parts.

426. HEMOPTYSIS OR EXPECTORATION OF BLOOD may arise from a general transudation from the mucous membrane lining the bronchial tubes, or it may be from a large vessel exposed by an ulcer or cavity in the lungs. If the latter, the ulcer in itself is more to be dreaded than the bleeding; and in case it is from the former cause, everything depends upon the exact nature of the mischief. Thus, a slight hemorrhage in phthisis is a symptom of congestion caused by the pressure of tubercles; and though the quantity lost may be trifling, yet the danger is nevertheless great from the usual progress of the tubercular disease. But if even a copious bleeding takes place from the lungs as a result of mere temporary congestion, the danger may be trifling, and the patient may get quite well. The symptoms of hemoptysis are—a coughing up of *bright red* blood mixed with air bubbles, and occasionally having red clots with it, but not that black blood which is seen in vomiting of blood. Sometimes, however, the blood from the lungs is swallowed, and being rejected by the stomach presents the appearance of hematemesis; but here there is almost always *some* blood expectorated, and the mistake can hardly be made by any careful observer. There is almost always, too, the presence of cough in hemoptysis, which will serve as a further guide.

427. EPISTAXIS, OR BLEEDING FROM THE NOSE, is an oozing of blood from the lining membrane of the passages and cavities at the back of that organ. Except in those who are afflicted with the hemorrhagic diathesis, little danger attends this complaint, but in such a case death may occur.

428. BLEEDING FROM THE SMALL INTESTINES is usually evidenced by the passage from the bowels of a pitchy or coffee-coloured fluid. It generally is met with in organic diseases of the liver, attended with great congestion, or in the last stages of low fever.

429. BLEEDING FROM THE LARGE INTESTINES may be either congestive, in which case the blood is dark, but still red; or it may be the result of ulceration in the cœcum or colon, when it is of a similar colour; or it may arise from ulcerated piles, when the colour is a *bright* red.

430. HEMORRHAGES from the kidneys and bladder have been described along with the inflammation of those organs (see page 105).

431. MENORRHAGIA is an immoderate flow of blood from the lining membrane of the uterus, and may be merely functional and symptomatic of general plethora or of congestion of the liver, or it may depend upon organic disease of the organ. It is known from the natural monthly secretion by the blood coagulating before or after it comes away. For a further description of this kind of hemorrhage, see the *Diseases of Women.*

432. A VICARIOUS HEMORRHAGE sometimes takes place in the female sex, in which the mucous membrane of the lungs or stomach, or the vessels of the skin, take on the duty of the uterus, and secrete a bloody fluid periodically, in lieu of that organ, which is defective in its proper functions. These cases are, however, too rare to require further notice here.

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CHAP. XVIII.

CHRONIC DISEASES SUPPOSED TO BE CONNECTED WITH THE NERVOUS SYSTEM.

SECT. 1.—EPILEPSY.

433. EPILEPSY, or *falling-sickness*, has hitherto eluded the investigations of those morbid anatomists who expect to be able in all cases to follow with their rude and imperfect senses the operations of nature. As in all like cases, it has hitherto been classed as a nervous disease, though it appears to be quite as probably one of the blood. It manifests itself chiefly by convulsions of all the muscles of the body, attended by a loss of consciousness, and generally preceded by a peculiar warning sensation, which has been called *aura epileptica*. The unhealthy conditions of the body, co-existing with epileptic cases, have been noted with a view to a discovery of its cause; but they are so various and conflicting, that hitherto no light has been thrown upon the subject, and all we know of the disease is summed up in a catalogue of the symptoms attending upon the paroxysm, which are pretty much alike. Thus it is sometimes accompanied by distinct disease of the brain, at others there is not the slightest evidence of such a change. In some cases the stomach is out of order, in others it is strong and active. The liver again may be torpid or over active, or the uterus may be in a state of disease, or, on the other hand, all its functions may be perfectly healthy. Neither sex nor age has any apparent influence, as the male and female, and the young child and its grandfather, alike submit to the disease. It will, therefore, be useless to attempt to give more than a description of the premonitory symptoms, as well as those of the paroxysm or fit itself. The former are chiefly pain in the head, lassitude, noise in the ears, slight palpitation, and sensation of creeping, as well as certain unusual sensations which are peculiar to individual cases, and which vary immensely. The symptoms of the *epileptic fit* itself are, a sudden loss of the power of motion and sensation, so that the body is incapable of maintaining any position but that which it assumes by its own gravity. Almost immediately, nearly the whole of the muscles of the body are convulsed, more especially those of the limbs and face, and even those of respiration being more or less affected, so that respiration is very imperfectly performed, and the blood is so badly decarbonised, that the lips are quite livid, or of a deep blue. The heart beats violently, possibly owing to the imperfect action of the lungs, the contents of the bowels and bladder are often expelled involuntarily, and the jaws are set, while a quantity of froth, often bloody from injury to the tongue, is expelled from the mouth and nose. The chief danger in the fit is of injury from some surrounding object, or of falling from a height or into the water. After a time, varying from a few minutes to many hours, the convulsions gradually cease, and the patient either at once recovers sensation and mental power, or else sleeps profoundly for some little time, and then awakes nearly as usual, but generally exhausted and suffering from headache or giddiness. These fits, in some people, occur habitually two or three times a day, but more commonly once a fortnight or month, or in many cases only one or two in the year. They do not necessarily shorten life, as there are instances of epileptic patients living to a great age, and I have myself known one who died at eighty-nine, having been a confirmed epileptic from his earliest childhood, and seldom having passed a month without a fit. He was a very powerful man, and in other respects perfectly healthy; but in most instances epileptics are considerably below the average in point of general health, and their lives would seldom be accepted by the examiners for insurance offices, even if they were not informed of the existence of the disease.

434. EPILEPSY MAY BE DISTINGUISHED from apoplexy by the absence in its patients of stertorous breathing or coma, and by the presence of convulsions and *frothing at the mouth.* From hysteria it may also be known by the absence of consciousness, which is seldom entirely lost in hysteria, though sometimes nearly so. There is, however, occasionally some difficulty in distinguishing it from this last ever-varying affection, as we shall presently see.

SECT. 2.—HYSTERIA.

435. THE EXACT NATURE OF HYSTERIA is, if possible, still more difficult to ascertain than that of epilepsy, because its forms are more numerous; and here again, although an impoverished condition of the blood seems in most cases to attend upon it, yet it sometimes happens that it is developed in those who are apparently healthy in this department of the animal economy. For this reason, again, it is considered by many to consist in some obscure affection of the nervous system; but, after all, this point is of little consequence, excepting in so far as it bears upon the treatment; and here we shall find that other guides will be sufficiently serviceable without any reference to the exact essence of the disease. According to Sydenham, whose accuracy is well known as an observer of disease, hysterical symptoms are manifested in one half of the chronic diseases to which the human frame is subject; but his definition would perhaps include some which are not in the present day considered to be specially hysterical, but rather those belonging to mere weakness of the animal frame. It is necessary to distinguish between *hysteria* and *hysterics*—the former bearing the same relation to the latter which the gouty diathesis does to gout, that is to say, there is in hysteria the tendency to the manifestation of the symptoms known as hysterics, but still they may be kept in abeyance.

436. HYSTERIA, by which, as I have explained, the *hysterical diathesis*, or *tendency to hysterics* is to be understood, is usually met with in females between the age of puberty and forty-five, though it is not limited to the latter age, nor is it always confined to the female sex, as it is occasionally met with in men of delicate frames, and of what is called highly nervous temperaments. It is a condition easily recognised by the experienced practitioner, and yet very difficult to define, inasmuch as its subjects have a peculiar tendency to put on many of the appearances of an immense number of diseases wholly different in their several natures; and there is not only this bodily tendency to simulate other diseases, but the mind also is often impressed with a desire to impose upon others, by pretending that the body suffers in a way of which it is wholly free. If, therefore, I were obliged to fix upon a characteristic of hysteria which is most invariable, I should select this one, viz., a tendency to bodily and mental simulation of disease. As instances of these, I may mention that we constantly meet with cases in which nearly all the symptoms of hepatitis, of scrofulous enlargements of the joints, peritonitis, pleuritis, laryngitis, &c., are evinced, and yet no inflammation whatever really exists. And, moreover, we also meet with others in which complaints are made of intense headache, or of loss of appetite, or of acute pain in particular situations, and in which, by a little management, it may be ascertained that no pain whatever is really felt. In some of these last, the tendency is so strong that repeated blisters, or even more severe remedies, will be borne unflinchingly, rather than confess that the original pain is abated, and so give up the amount of pity which appears to be their chief object. Next in prominence and universality to this peculiar feature is the irregular circulation and development of heat which most hysterical persons complain of. In some, the whole body is alternately hot and cold, in others, the feet and hands are icy-cold, while the head and face are liable to strong flushes. Almost all hysterical subjects are more or less subject to dyspepsia with flatulence, which last is marked in proportion to the probability of an outbreak of hysterics, and during the

paroxysm, is almost always present. Palpitation of the heart is also a very usual concomitant, and that excitable condition which is called "being nervous." Joined to any or all of these, and occurring as almost invariably the first symptom of the paroxysm, though sometimes by itself, is what is called *globus hystericus*, a sensation as if a large ball occupied the upper part of the throat, and was fixed there beyond all power of dislodgement. This gives considerable pain, but more uneasiness, and is felt by some people on every occasion, which upsets their equanimity whether the emotion be joyful or the reverse. Such a sensation is always said to be hysterical; but, as "one swallow does not make a summer," so this one symptom does not by its presence make up the peculiar condition we are now considering, though, if all the others above enumerated, or the greater part of them are present, it may safely be asserted that the individual presenting them has a tendency to hysteria, and under exciting circumstances will probably show the hysterical paroxysm in full activity; or on the other hand, if suffering from any painful local affection resembling inflammation, in which the peculiar signs of that condition are absent, it may be conjectured that it is a manifestation of hysteria, and an instance of that simulation which I have before described.

437. THE HYSTERICAL PAROXYSM, or *hysterics* (by which latter name this sudden onset of the disease is called) is marked by the following symptoms, which may be said only to occur in those of the hysterical diathesis; but by a reference to the above description, that will take in so wide a field that few would be excluded, except perhaps the very robust and "iron-nerved" of both sexes. *A mild fit of hysterics* will be just as likely to commence with an immoderate fit of laughter as of crying — any mental excitement being likely to develop it; or sometimes without the slightest reason, apparently beyond the active imagination of the individual, a burst of crying or laughter will astonish the company present, and the fit will commence. The *globus* is always felt at this time, but beyond this feature, and the laughing and crying, with an occasional shriek and slight convulsive movement of the limbs, the attack seldom goes, and there is no loss of sensibility, though there is often an utter want of power of controlling the body or mind, which is often very galling to the delicate minded. When these alternate laughing and crying fits have lasted for some little time, they gradually subside, and the calm following them is often very complete, the body having apparently worked off its superabundant irritability, and being in a more healthy state than before. *The more severe forms of hysterical paroxysm* are much more complicated in their symptoms, and sometimes there is even a temporary loss of consciousness and of the senses, as well as of command over the voluntary muscles. Very often the attack begins in the same way as described above; but in a short time the laughter and crying (which are at first not very different from these sounds, when of a healthy character) become converted into most unearthly noises, the larynx being affected with spasm, and producing a crowing sound or a harsh scream, or some other unnatural and distressing noise. The hands grasp the hair, and tear it out by the roots, or clutch any other object within reach—the breathing becomes convulsive, or is almost stopped for many seconds together, while the face is flushed, partly from the excessive action of the heart, and partly from the stoppage of the respiration. It is seldom that the blood is so imperfectly decarbonised as to render the lips livid; but I have seen on one or two occasions hysterical paroxysms, in which death has appeared to be almost certain from the strangulation produced by spasm of the larynx, and where the whole countenance was perfectly livid. But in these, just as it is in epilepsy, the spasm gives way before life is actually extinct, and respiration soon restores the healthy condition of the blood. Generally speaking, the patient

seems to feel great uneasiness at the chest or pit of the stomach, and tears or grasps at her stays, or any other article of clothing, with which that part is invested. A paroxysm of this intensity will usually last for at least an hour, and often for five or six; and when it does go off, the patient is left exhausted, and suffering from intense headache, or from general soreness about the throat and chest. A copious secretion of very pale urine, almost resembling water, very often accompanies the disease.

438. A PAROXYSM OF HYSTERIA may be distinguished from epilepsy by the signs mentioned at par. 420, as well as by the absence of that distortion of the features, which is so marked in epilepsy. There is also very frequently in hysteria a tremulous motion of the eyelid, which does not exist in epilepsy. There is no other disease, except apoplexy, with which the hysterical paroxysm can well be confounded, and then the absence of all convulsion, the coma, and the stertor, mark too plainly the existence of a disease of the brain quite distinct from hysteria.

439. HYSTERICAL SIMULATIONS of active local inflammation are the most difficult to detect, and few, but those who are fully conversant with disease, are able to cope with the difficulty. I know no means by which rules can be laid down for distinguishing between the two; and I should certainly on some occasions have been much puzzled myself if I had not previously known of the hysterical diathesis. I have seen croup simulated so closely that none could possibly make up their minds to abstain from depletion, if the present symptoms only had been taken into the account, and yet the peculiar noise was wholly owing to hysterical spasm and not to an effusion of lymph. Nevertheless, such instances are rare, and it will seldom fall to the lot of any but the medical attendant to have to make up his mind on a doubtful case of this kind. Still it may happen; and it is well that the truth should be known, even if it is not often to be acted on.

SUB-SECT. 3.—CATALEPSY AND TRANCE.

440. THE TERM CATALEPSY is applied to a very rare disease, of the nature of which we know nothing whatever, and consequently term nervous. Its one symptom consists in the stiffening of the body in the exact attitude in which it was attacked by the disease; and in this respect it appears closely to resemble the condition of the pointer or setter-dog when scenting game. All the voluntary muscles of the body are rendered rigid, and the attitude may be that of standing, or lying, or sitting, as the case may be.

441. A PARTIAL CATALEPSY has been produced by the mesmeric passes in many cases of excitable temperament. Of this there can be no doubt, although the condition has been imitated by impostors in public exhibitions; but a true cataleptic rigidity of the arm and leg has been so often excited by respectable private individuals acting upon similarly trustworthy agents, that there can be no reason to doubt the existence of the power, however unable we may be to account for it.

442. IN TRANCE, the body remains quiescent as in catalepsy, but the muscles are relaxed instead of being rigid. It also is very rare, though well recorded instances have occurred in which it has been so complete as to lead to the belief in the death of the individual, and burial has either taken place, or has only been prevented at the last moment. Decomposition of the tissues is the only clear proof of death which we can have; but still in most cases the evidence is so strong that no one in these days need have the slightest fear of being buried alive, especially in this country where five or six days are always allowed to elapse between the death and the interment.

SUB-SECT 4.—CHOREA.

443. CHOREA, or *St. Vitus' dance*, consists in convulsive movements of the voluntary muscles of the body, which are partially under the control of the will, and not attended by a loss

of consciousness. The disease generally attacks children between the time of cutting their permanent teeth and puberty; but sometimes it comes on later than that period in a slighter degree than usual. The muscles of the face are those most frequently attacked, then those of the extremities of *one side*, and after them, come those of the body, and in very severe cases, of all at once. When the limbs are affected, the walk is unsteady, and subject to occasional jerks or snatches, which are very painful to witness. When the whole body is attacked by chorea, walking is out of the question, and the body will bound from the ground in a most extraordinary manner, totally beyond the control of the patient, and requiring a padded surface on the floor, as well as the walls of the room, to prevent severe injury. The convulsive movements are pretty constant, though with short intervals between them, and with the exception of the state of sleep, when they are always entirely suspended. With regard to the cause of the disease, there is some reason for believing that it is to be looked for in the nervous system, and most cases of chorea are plainly coincident with irritation of some part of the nervous centres, especially the spinal cord, accompanied with general weakness, such as that which occurs after severe fevers. It may readily be distinguished from epilepsy and hysteria by the respiration being unaffected, and by tho constant occurrence of the convulsions during the waking hours. Chorea is very apt to accompany worms, or any other chronic disorder of the digestive organs in children of the age specified.

SUB-SECT. 5.—MANIA.

444. MANIA, or *insanity*, may be described as a chronic disease, in which there is a marked deviation from the healthy state of the mind, which is evidenced in one of three modes—1st, in a perversion of the ordinary feelings, habits, and likings of the individual (*moral insanity*); 2nd, in a disturbance of the intellect, so that the mind labours under hallucinations or erroneous impressions (*intellectual insanity*); and, 3rd, in a confusion of thought, in which the faculties seem out of order, and all attempt at the expression of ideas is incoherent (*imbecility*). Besides these forms, there is also another, in which the mind is partly sane and partly insane upon some particular subject, in which case the individual is said to suffer from *monomania*. Such is the most common, and probably the most correct scientific definition of insanity; but there is also a legal one, which has a most important bearing upon the interests of mankind. It must be remembered that the physician and the lawyer have two very different tasks to fulfil in their consideration of this disease; for while the former has to investigate it with a view to its curability in the individual, the latter has chiefly to regard it as bearing upon the welfare of others, and thus he is not called upon to interfere, unless the maniac is dangerous to the person or property of others, or sometimes of himself. Consequently, the harmless maniac is beyond the care of the law, if he is not only so with regard to others, but also in reference to his own property; but if he cannot take care of that, the law will kindly step in, and take a share of its superintendence, leaving none to the unfortunate individual himself. Hence it is, chiefly, that the physician and the lawyer are so often at loggerheads with regard to lunacy; but this certainly does not account for the former differing with his brethren, which is quite as remarkable as the difference with the legal profession. The lawyer's view is mainly dependent upon the necessity or otherwise of restraint, and the responsibility or otherwise for actions which in a sane man are punishable by tho law; and it entirely disregards the probable termination of the disease, if allowed to run its course unchecked—a question of the utmost importance for the physician's consideration.

445. The question connected with the existence of iusanity in any from is one which requires only a complete

knowledge of what is called "human nature" to determine, and is often better left to the decision of an unprofessional person of experience in the "ways of the world," than to a medical man who has had no practical knowledge of insanity. Nevertheless, such people are not often met with, and therefore the best plan is to have recourse to medical aid to decide the matter in doubtful cases. With regard to restraint, and to the removal from the ties of family, it is undoubtedly found that in most instances it is impossible to treat lunatics at home, and that they are much more likely to recover their sanity if thrown among entire strangers, than if nursed by those whose affection and fear they can easily work upon. For this reason a removal to some well managed asylum is generally desirable. Even in recent harmless cases, as far as the probable result is concerned, and undoubtedly in all those where violence is threatened, such a course is the only safe one for all parties. Still, I believe the law is quite right in exercising a jealous control over the power of ordering a confinement of this nature; and, although individual cases of danger from violence are often met with, owing to the present difficulty of procuring a medical certificate of its necessity, still this is better than to permit the horrible risk of incarcerating a sane man among the insane, because his liberty would be prejudicial to the interests of those who have procured his confinement. The subject is, however, full of difficulties, and all that can be done is to consult the general welfare of all parties, and carry out what is believed to be the most prudent course, taking all the bearings of the case into consideration. If restraint is decided on as beneficial or necessary, the certificates of two legally qualified medical practitioners must be obtained, except in the case of paupers, when one is sufficient, provided the party has previously been examined by a justice, clergyman, or overseer, who has signed an order setting forth the particulars of the case. The law expressly requires from each medical man a separate visit and personal examination of the alleged lunatic, and a separate certificate must be signed setting forth some *special fact* upon which the opinion of lunacy is founded, such as the attempt to commit murder or suicide, or the absolute threatening to do so.

446. Although there is every reason to believe that in most cases mania depends upon some disease of the brain, yet the question does not admit of positive proof in the present state of our knowledge of the structure and disease of that organ. Some forms of insanity are clearly connected with disorders of the organs of digestion, such as that which is denominated *hypochondriasis*, and which, in a mild form, is almost always more or less developed in those who suffer from great and long-continued derangement of the liver and stomach. Here the delusions are often extreme, and instances are common enough in which patients fancy that they are tea-pots, or that their heads are set on the wrong way, or some other equally absurd belief of what is contrary to the fact. The term *mania* is sometimes confined to raging or violent madness, whilst *melancholia* is applied to that of a low and desponding kind; but there does not seem to be any reason for this division, although without doubt the two distinct manifestations are met with, but they often alternate, and they do not seem to depend upon different causes, or even to occur in different temperaments or constitutions with any degree of regularity.

CHAP. XIX.

CHRONIC DISORDERS OF THE DIGESTIVE ORGANS.

SECT. 1.—DYSPEPSIA.

447. DYSPEPSIA or *indigestion*, as most of my readers must be aware, means *bad*, as opposed to *good* indigestion; and, therefore, in order to understand the meaning of the former, the latter must first be investigated, and we shall then have no difficulty in understanding the comprehensiveness of the term, however we may be puzzled by the contradictory and opposite deviations from the healthy state which are constantly met with.

448. DIGESTION is the process by which the food after it is taken into the stomach is converted into a smooth and pultaceous fluid, from which the absorbent vessels may be able to take up the materials capable of becoming *blood.* In man the organs concerned are—the stomach, small intestines, and liver, as well as to some extent the pancreas and salivary glands. The structure and separate functions of these several organs have been described under the head of the inflammatory diseases to which they are subject; but in this section we have to consider their chronic deviations from the healthy function which they are intended to co-operate in performing, and which is well known by name as that of digestion. The division of the food in the mouth by the teeth and its mixture with saliva is chiefly of a mechanical nature; but in the stomach the whole process is submitted to chemical laws, and the change is one of solution, similar to that which is effected in the laboratory by means of heat and chemical substances called solvents, and like that aided greatly by gentle agitation of the various matters together, which in the stomach is effected by the fibres of its muscular coat. When the food reaches the stomach (whose walls are protected by a layer of mucus from acrid articles of diet) a quantity of gastric-juice is immediately poured out by small follicular glands situated beneath the mucous surface. This peculiar fluid appears to contain a free acid (the nature of which is not clearly made out), with an organic compound called pepsine, and together they exercise a most remarkable solvent power over substances of an albuminous nature. It is supposed that the pepsine acts like a ferment, while the acid possesses the solvent principle. Gastric fluid obtained from the human stomach, and kept at the average temperature of the interior of the body, soon dissolves meat, vegetables, and other articles of ordinary food, and acts as far as the surface without the aid of agitation; but to complete the solution, the matters must be gently shaken, so as to apply the acid to a fresh layer as fast as the external one is rendered soluble and capable of being removed. In experimenting in this way with gastric fluid out of the body, it is found that, when the temperature is reduced much below 100 deg. Fahrenheit, the solution goes on very slowly, showing that blood-heat is necessary for the digestive processes, and that large quantities of cold liquids taken into the stomach must have a considerable tendency to retard the process. When the food has in this way been submitted to the action of the gastric fluid in the stomach for some two or three hours, it is converted into a fluid like gruel, which is called *chyme*, and at this stage a large proportion of its watery particles is absorbed by the veins and ordinary absorbents of the stomach, and carried direct into the blood, so that we find that its bulk rapidly diminishes, and that the odour, and even the colour of many substances, may be detected in the urine within an hour or two of being swallowed, as may be proved after a hearty meal of asparagus. It is also probable that the albuminous and saccharine matters pass off in this way, leaving the oily particles and great part of the starch

to be acted on by the bile and pancreatic fluid in the duodenum. On turning to par. 301, it will be seen that bile has the power of saponifying fat, and so when the oily matters contained in the food pass on from the stomach they meet with the bile, and are changed into an emulsion of a milky character, which takes the name of *chyle*. The starch, also, which was not converted into sugar by the saliva swallowed with the food, meets here with the pancreatic fluid, and by it that necessary change is effected. But besides these conditions, it is also necessary that the useless particles shall be carried off through the lower bowels; and for this purpose, therefore, they must be kept in a healthy condition, and must be supplied with their natural kind of stimulus, which appears to consist in the excrementitious part of the bile (see par. 301). Thus there are a great number of needful elements required for a healthy or good digestion, being—1st, a proper mastication and insalivation of the food; 2nd, a supply of gastric fluid sufficient to dissolve the amount swallowed; 3rd, a healthy condition of the stomach, so as to retain the food in it for a proper time, and agitate it in a suitable manner; 4th, a proper quantity and quality of bile and pancreatic fluid; and 5th, a healthy action of the bowels to enable the excrementitious parts of the food to pass off, and thus make way for the regular passage of each meal in succession over its appointed surface.

449. THE SOURCES OF INDIGESTION are to be met with in each stage; for, in the 1st, mastication is often very imperfectly performed, and, as a consequence, the food is presented to the action of the gastric juice in masses of too large a size, and unmixed with the saliva, which has the property of converting the starchy matters into sugar, so as to be at once capable of absorption from the stomach. In the 2nd, as the gastric juice is only secreted by the stomach in quantity sufficient to dissolve the amount of food required by the wants of the system—if more food is swallowed than is demanded by those wants, part of it will be left undissolved, because there will not be gastric juice enough for the purpose. This is a constant cause of indigestion, since it is always found that undissolved masses of food, however small, offend the delicate lining membrane of the pyloric end of the stomach and of the small intestines, and cause irritation and a secretion of acrid mucus, together with a fermentation and development of gaseous matters or "wind." The 3rd stage is thus affected considerably, for the irritation produced will either accelerate too much or retard, the passing on of the food, and the gas disengaged will prevent its being properly submitted to agitation, as the stomach is distended beyond the power of contracting upon its semi-fluid contents. In the 4th stage, or that dependent upon a due supply of healthy bile and pancreatic fluid, the liver and pancreas are mainly concerned, and these again are, to some extent, influenced by the state of the duodenum, through the coats of which their duct passes, and if it is inflamed or irritated, the flow of these fluids will be retarded; and lastly, the 5th stage is almost sure to be considerably modified by any of the previous ones if they are out of order, since an irritating fluid, in the place of good chyle, will pass by the open mouths of the lacteals, and will be expelled from the bowels in a loose condition, accompanied with pain and general feeling of distress; while, on the other hand, if there is not stimulus enough in the shape of good bile, or if the absorbents are rendered over-active by any cause connected with the four processes mentioned above, the excrementitious matter is left too hard and dry, and the lower bowels have no power to pass it through them, giving rise to habitual constipation.

450. When we know the probable causes of future disorders in a machine, it is comparatively easy to prevent them; and this would be easily done by most of us, if it were not for the artificial nature of our lives, which leads us, in the first place, to avoid taking bodily exercise enough to wear

down the muscular system, so as to demand a supply of food commensurate with our appetites, as measured by our *palates.* The Creator has implanted in our nature two instinctive feelings or appetites, which are intended to regulate the supply of food required by the wants of our system; and if we were guided by them, we should seldom have indigestion; but, at the same time, we are supplied with a sense of taste, which is pleasantly affected by certain articles of food passing over it, and to gratify this is more the object of our meals than to satisfy mere hunger and thirst. And, moreover, we not only eat what amount is pleasant of one kind of food; but we change the flavour, and as soon as the palate palls with one, another is tried with more success. The consequence is, that we almost all eat far more than we should do if our appetites alone were suffered to guide us, and a great portion is in consequence passed on through the stomach without being properly mixed with gastric fluid and digested into chyme. Besides which, the liver being overdone by unhealthy blood, and the flow of bile being thereby diminished in quantity, and also retarded in its flow into the duodenum by the irritation of its coats, the chyme is imperfectly chylified, and the excrementitious matter is not rendered fit for its passage through the bowels. So much for the effects of an improper *quantity* of food; but this mischief is still further increased by the *quality*, when it is unfit for the purposes of digestion and assimilation, either from being two olly, or too full of starch or woody matter, or too rich, or on the other hand of too poor a quality. There is a certain proportion of animal and vegetable food mixed with fruits, which is suited for the supply of man, varying according to the latitude which the individual inhabits, and also to the moisture and the habits which he indulges in. If this proportion is maintained, the stomach is kept at its best, when accompanied with a due amount of exercise, fresh air, &c.; but on the contrary, every deviation from these elements of health will more or less retard the healthy process of digestion, and tend to produce an imperfect performance of it.

451. HUNGER AND THIRST are sensations implanted in man in order to induce him to supply the proper quantities of solids and liquids which are required by his system. Of their precise nature we know nothing; and we must content ourselves with examining the circumstances attending upon them as far as we can ascertain them. Neither of these sensations is in all cases produced by the empty condition of the stomach, nor are they always prevented by its being filled with food, for we find that hunger is not satisfied by the most ample meal if the body has been imperfectly fed for some time previously; whilst, on the other hand, if fluids have been scarce, or if sapid substances have been eaten in large quantities, no quantity of water or other liquid will quench the thirst which is felt. Both hunger and thirst may, therefore, be considered as evidence that the system is in want of the respective kind of aliment which each indicates to be required; but it must always be remembered that the desire to gratify the *palate* is not necessarily hunger or thirst, but may merely be a craving after the pleasures of the table, and we know that it is often carried far beyond the exigencies of the system.

452. INDIGESTION is met with in various forms, as far as its symptoms are concerned, though all are to be classed under one or other of the above conditions in regard to their causes and precise nature, however they may differ as to the effects produced upon the stomach. Thus the various errors already alluded to will in some cases produce a *want of tone* in the stomach, in others *congestion*, in a third set, *an irritable* or *painful condition* of the nerves (*gastralgia*), and in a fourth, a *copious flow of watery fluid*, commonly known as *water-brash.*

453. WANT OF TONE IN THE STOMACH is the most common form of indigestion, and is marked by loss of appetite, or sometimes even nausea, heart-burn, a sense of fulness after eating, attended with, and caused by, flatulence, great weakness in the diges-

tive powers, particularly as regards oily, sweet or acrid substances—tongue pale and flabby, often covered with a white fur, and showing indentations corresponding with the shape of the teeth—bowels generally confined, but sometimes the reverse is the case, urine not affected, pulse weak, skin pale and flabby, extremities cold, and spirits languid. A constant dull headache often accompanies this form of indigestion.

454. CONGESTIVE DYSPEPSIA is attended by a condition almost approaching to inflammation, but really not going beyond the stage which has been described as congestion. The *symptoms* are a painful digestion of food, with tenderness on pressure at the pit of the stomach—thirst and slight inclination to vomit at times; tongue of a bright red colour, crossed with cracks or fissures, and shining; bowels confined; urine high-coloured; hands and feet hot and burning after meals, as also is the face very generally, and especially the nose; pulse small and wiry. There is not much tendency to the disengagement of gas in this affection, but this varies a good deal in different patients.

455. IRRITABLE OR NEURALGIC INDIGESTION is marked by a severe pain, commencing about a half an hour after eating, and continuing till the stomach is empty again. This pain is relieved by gentle and long-continued pressure, as by bending forward in a sitting position. There is considerable flatulence; and the stomach continually rolling the food in this gas, a curious rumbling noise is heard. Appetite variable but seldom much impaired, pulse not affected, no feverishness, tongue tolerably clean, bowels confined, urine copious and clear, spirits low and temper irritable, head seldom affected; but there is a great variation in these symptoms.

456. WATER-BRASH is marked by almost all the symptoms enumerated under the last form of dyspepsia (par. 455), together with a profuse discharge of thin watery fluid when the stomach is empty. Very often a pint will be brought up in quantities of about half an ounce at a time without straining, but with a slight eructation. It is very commonly met with among those who live almost exclusively upon oatmeal, but for what reason we do not know. It also attends upon some of the malignant diseases of the stomach.

SECT. 2.—CHRONIC DISORDERS OF THE LIVER AND BOWELS.

457. THE LIVER is subject to a torpidity of action, which appears to be generally the result of congestion, but which may also arise from some defect in its nervous stimulation. But of the fact there can be no doubt, nor is there any accounting for it in some cases, as it is apparently congenital; and, unless we suppose it to be hereditary, we have no explanation of it to offer. Sometimes there is a tendency, on the other hand, to too great a flow of bile, by which the opposite effects are produced. When too little is secreted, the blood is not properly purified, and the poisonous effects of the elements of bile retained in it are manifested according to the extent of the mischief (see par. 301). There is also constipation from a want of the natural stimulus of the bile.

458. If, on the other hand, there is too much bile, the bowels are irritated, and very often there is a regurgitation into the stomach, accompanied by vomiting, in which case bile is brought up of a green or yellow colour, according to the nature of the secretion in each particular case. This is generally accompanied by bilious diarrhœa.

459. A WANT OF TONE in the bowels is the result of the same causes as produce that condition in the stomach, namely, previous over-stimulation and consequent exhaustion, so that the muscular fibres relax, and allow of their contents accumulating, instead of passing them on at the proper time. Flatulence generally accompanies this condition of the bowels, and very often they are distended to a frightful extent, partly owing to the food being imperfectly mixed with bile and gastric fluid, and partly to a positive secretion of air from the mucous membrane itself.

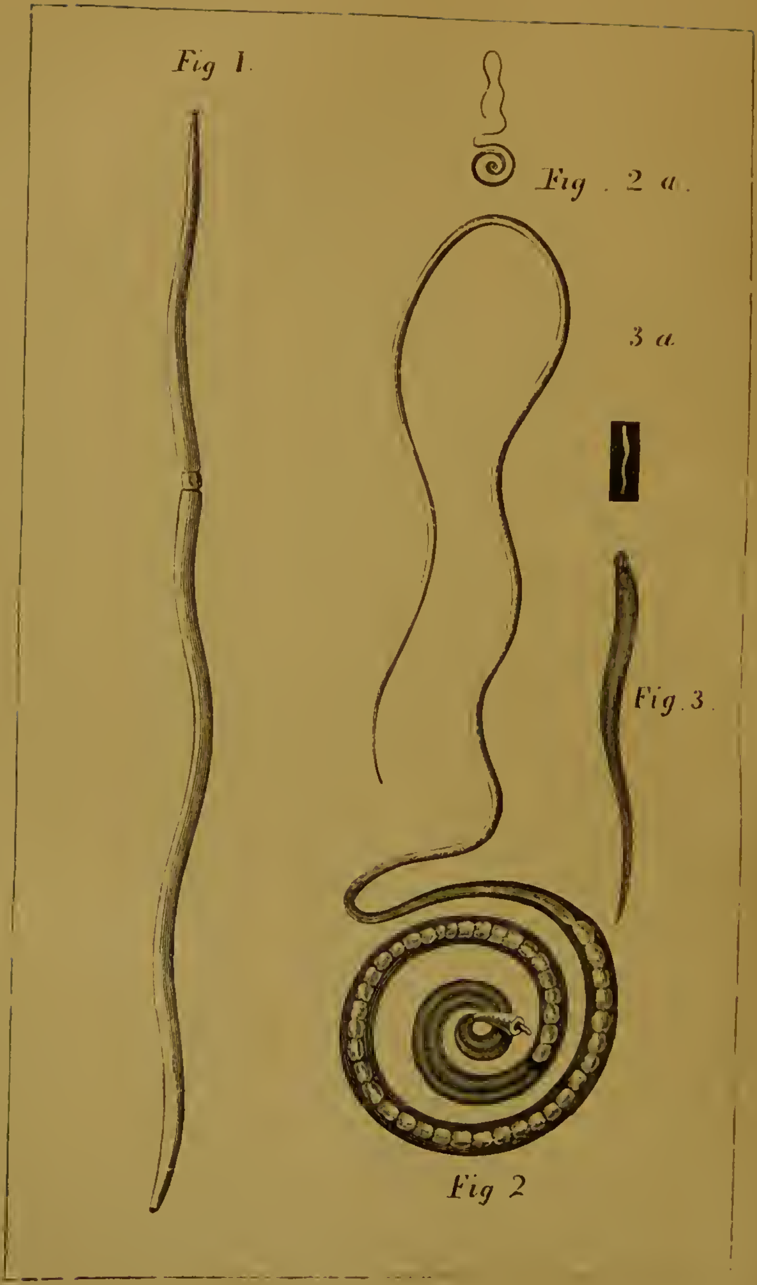


Fig 1.
Fig. 2 a.
3 a.
Fig. 3.
Fig 2

INTESTINAL WORMS. P. 157.

Fig. 1. The Round-worm, natural size
,, 2. The Long Thread-worm, magnified. *Fig.* 2*a*. Ditto, natural size.
,, 3. The Short Thread-worm, magnified. *Fig.* 3*a*. Ditto, natural size.

which appears really to take place in some rare cases.

460. CONSTIPATION is produced either by want of tone in the muscular coat of the bowels, so that it does not pass on the contents, or by such a tendency to absorb the fluid elements that the fæces are left in too solid a form for the muscles to act upon. The latter is perhaps the more common variety, especially when combined with a want of habitual attempt at relief.

461. HABITUAL LOOSENESS OF THE BOWELS is sometimes too great, owing to the absorbents not taking up the fluid particles sufficiently, or the muscular coat being irritated and passing the food on too quickly, so as not to allow time for them to act. It is sometimes so great as to occasion loss of flesh, and yet can scarcely be considered to amount to diarrhœa. It is very often owing to a naturally irritable mucous membrane, which is peculiar to families, just as the reverse is met with in those who are subject to constipation.

CHAP. XX.

PARASITIC ANIMALS INFESTING MAN.

SECT. 1.—GENERAL REMARKS.

462. The parasitic animals which are met with in the human subject are not very numerous, and are described by naturalists under two divisions—1st, internal parasites (*entozoa*); and, 2nd, external parasites, including the *acarus scabiei*, described at page 65, lice, &c. Entozoa, again, comprise the several varieties of intestinal worms, and also hydatids, as well as various other and more rare parasitic animals, which are occasionally met with in the muscles, liver, eye, kidneys, &c. Intestinal worms are, however, those which are chiefly interesting in a medical point of view, inasmuch as they are the only kind which are capable of relief.

SECT. 2.—WORMS.

463. THE TERM WORMS is applied in medicine to the *entozoa* infesting the alimentary canal, which are of three different kinds—1st, the round worm; 2nd, the short and long thread-worm; and, 3rd, the tape-worm; but besides these, there are also some other worms found in the human body, though very rarely—such as *strongylus gigas*, inhabiting the kidneys; *spiroptera hominis*, occasionally met with in the bladder; and *filaria*, in the eye, &c.

SUB-SECT. A.—INTESTINAL WORMS.

464. THE ROUND WORM (*ascaris lumbricoides*) is from six inches to a foot in length when full-grown, and resembles the garden worm in appearance, though there are many remarkable points of difference by which the naturalist can easily detect the one from the other. Its natural place of abode is the small intestines; and though sometimes it ventures into the stomach, or descends into the large intestines, it does not remain there, but is soon expelled by vomiting, or crawls out by the anus, or is passed with the fæces. Sometimes they exist in great numbers, masses of them being found after death, or expelled during life; but, generally, a few only will be found at one time to inhabit the intestines, and chiefly in children or young persons before the period of full growth.

465. THE SHORT THREAD-WORM (*ascaris vermicularis*) is sometimes also called the *maw-worm*. The male and female vary greatly in size, the former being less than a quarter of an inch in length, while the latter is fully half an inch. They are of a white colour, with a very thin and pointed tail, and an obtuse mouth, with a bladder-like membrane on each side. They in-

habit the large intestines, especially the rectum, where they often exist in large quantities, particularly in young children. *The long thread-worm* (*trichocephalus dispar*), is from an inch and a half to two inches in length; also white, or if full of food, slightly pink in colour. The body is composed of two cylindrical and elastic portions of different diameters. The smaller of which occupies the anterior two-thirds, whilst behind this the other third grows out abruptly. It is one of the commonest species of worms inhabiting the large intestines, and especially the cœcum. Thread-worms do not appear to occasion much inconvenience, unless they exist in large numbers.

466. TAPE-WORMS, as found in the human body, are of two species—*tœnia solium* and *bothriocephalus latus*, the former being known as *the* tape-worm of this country, while the latter is the *broad tape-worm* common enough on the continent, but seldom met with in the British islands. The tape-worm thus distinguished has a long, flat, articulated body, gradually tapering to a thin neck, which ends in an enlarged head with four suckers. The full-grown worm is from four to ten feet in length; and one was observed in the dead subject by M. Robin to extend from the stomach to the anus. The taper part or neck in the worm of full size is about half a line in breadth, and eight or ten inches in length, and marked by rings or *rugœ*, while the body is made up of segments each nearly square in form, and separated by a distinct joint, and about a quarter or one-third of an inch in breadth. These are largest in the middle of the worm, and become narrower and longer towards the tail, which ends in the same termination as the other joints; indeed, it is continually throwing off one or more of these, but for what reason is not very clear. The broad tape-worm (*bothriocephalus latus*) is readily distinguished from the tœnia by the form of the segments, which are broader than they are long. The head of this worm has only recently been discovered; it is of an elongated form, two-thirds of a line long, and instead of the four suckers, it has two lateral grooves. In other respects, the two resemble each other, and by an ordinary observer no difference would be detected. The tœnia is found among the English, Germans, and Dutch; the bothriocephalus among the Russians and Swiss, and both are equally common in the French nation.

467. THE PRESENCE OF WORMS in the human body may be suspected when there is an enlargement of the abdomen in children, with a variable and often voracious appetite, picking of the nose, itching of the anus, fetid breath, slimy stools, emaciation, feverishness, grinding of the teeth, and sometimes convulsions in very delicate constitutions. Tape-worms are much more injurious than either of the other kinds, and the thread-worms least so. The round worms are very apt to produce disturbance of the bowels, though many suppose that their presence is the effect and not the cause of the mischief. It is, however, very difficult to settle this question, as we know little or nothing of the cause of their presence, nor are we able to say whether the worm precedes or follows the disturbance of function which at some time or other is remarked. Worms are constantly met with in examining bodies in which they were not suspected, and they are probably much more common than is supposed. Since, therefore, it appears that they may exist without inconvenience, it is difficult to say that they are always the cause of that which sometimes shews itself at the same time with them. Still, although a doubtful point, the general opinion is that they are always more or less injurious, and when they are known to exist, it is better to get rid of them if possible.

SUB-SECT. B.—WORMS FOUND IN OTHER PARTS OF THE BODY.

468. IN THE HUMAN KIDNEY a large worm (*strongylus gigas*) has occasionally been met with. It is of a dark blood colour, and is three feet in length when of full size, and half an inch in diameter. It is also found in

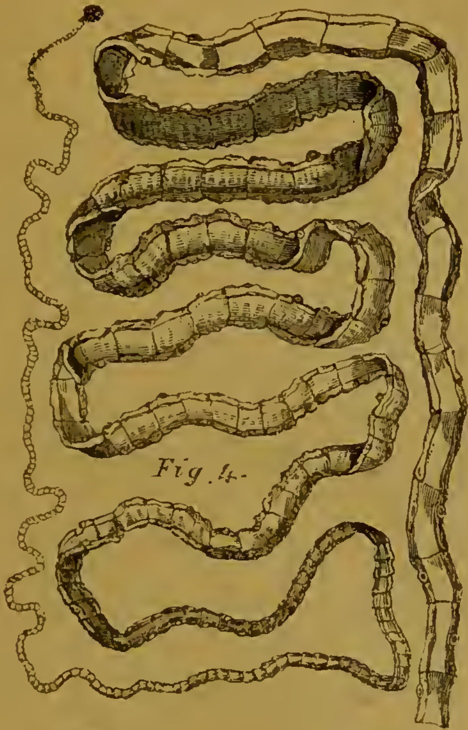


Fig. 4.

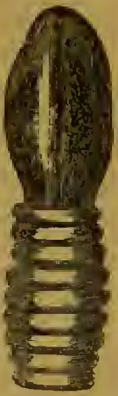
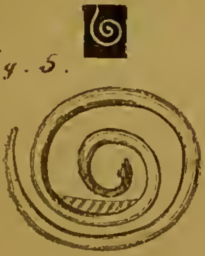


Fig. 4. a.



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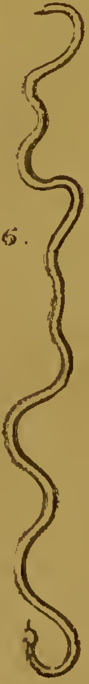

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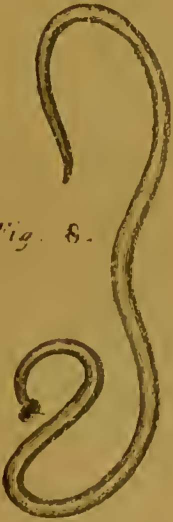

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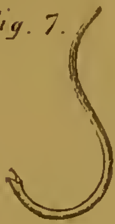


Fig. 7.

INTESTINAL AND OTHER WORMS. P. 158.

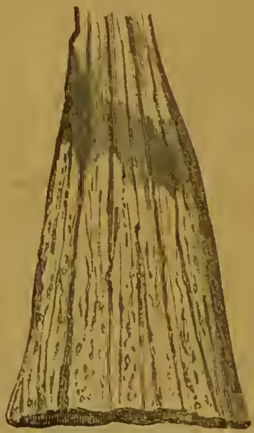
Fig. 4. The Tape-worm, natural size. *Fig.* 4*a*. Magnified head of Broad Tape-worm.

,, 5. Spiroptera hominis, magnified and natural size.

,, 6. Filaria Medinensis, or Guinea Worm.

,, 7. Filaria Bronchialis.

,, 8. Strongylus Gigas.



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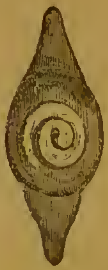


Fig. 9. a.

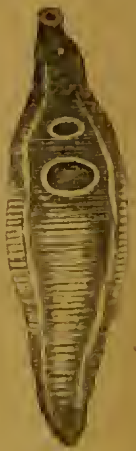


Fig. 11.

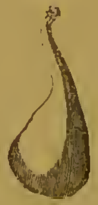
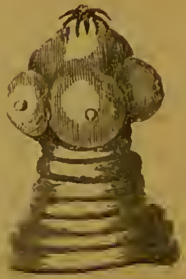


Fig. 10 a



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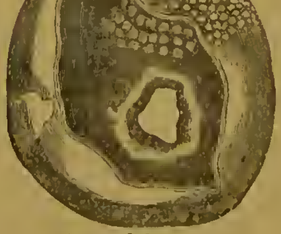

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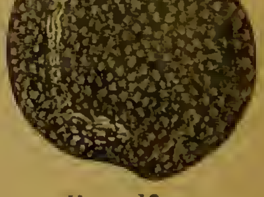


Fig. 13.

HUMAN ENTOZOA. P. 159.

Fig. 9. Trichina spiralis in human muscle. *Fig.* 9*a*. Magnified cyst of the same.
,, 10. Magnified head of Cysticercus Cellulosæ.
,, 10*a*. Cysticercus Cellulosæ, entire.
,, 11. Distoma Hepaticum, twice natural size.
,, 12. Acephalocystis exogena, or Pill-box hydatid
,, 13. Echinococcus hominis.

the domestic animals, and in some few of those in a wild state.

469. In very rare Instances a very small worm (*spiroptera hominis*) has been discharged from the human bladder; but its existence is questioned by many, and it need not, therefore, occupy our attention.

470. Floating in the human eye, or burrowing in the cellular membrane, or again in the bronchial glands, are three varieties of a small worm (*filaria oculi*, *filaria Medinensis*, and *filaria bronchialis*). The first of these has been met with on one occasion only in the fluid contained in the capsule of the lens of an eye, which was operated on for cataract. The second, commonly known as the *Guinea worm*, varies in length from six inches to twelve feet, and burrows through the skin into the cellular membrane, where it occasions considerable pain and uneasiness. The third, like the first, has only been found by one observer in the bronchial glands; and its existence is, therefore, somewhat doubtful.

571. In the Muscles of the Human Subject, a small worm has occasionally been seen in great numbers, enclosed in a little cyst, which is only one-fiftieth of an inch in length, and half that dimension in breadth. These cysts have a rough exterior, and contain a granular secretion, in which lies coiled up the little worm in question (*trichina spiralis*).

Sect. 2.—Hydatids, Flukes, &c.

472. In various situations in the body, but chiefly in the cellular membrane, there is found an entozoon, consisting of a jelly-like bag with an elongated neck, terminating in a head armed with suckers. This is the *cysticercus cellulosæ*, which has been discovered in muscle, in the brain, and floating in the eye. In the two first cases, a cyst or bag is formed by the inflammation of the surrounding parts, and this serves as an envelope in which each separate entozoon lies imbedded. In the eye it was found floating in the aqueous humour, causing such considerable pain as to demand its extraction. The cysticercus is the cause of the little masses of yellow matter which show themselves on the cut surface of "measly pork."

473. The Liver Fluke, which is so common in the sheep, has been met with in the liver of man in a few instances. This is the *distoma hepaticum*, generally seen in the gall-bladder, an inch in length, oval and flattened, with a round and small mouth.

474. The Common Globular Hydatid is frequently developed in the liver and kidney, and occasionally exists in prodigious numbers in dropsical cysts. It is undoubtedly an organised being, and consists of a globular bag of condensed albumen, containing a limpid colourless fluid, with a small quantity of albumen dissolved in it. This is called an *acephalocyst*, and grows by imbibition, reproducing itself by gemmation, or breeding like many others of the lowest forms of animal life; but as it does not give any evidence of feeling, nor does it move, it is scarcely to be ranked in the animal kingdom. There is one species only found in man—*acephalocystis exogena*.

475. A somewhat similar living bag is the *echinococcus hominis*, which also occupies cysts in the liver, spleen, omentum, &c. It is composed of an external yellow coriaceous coat, and an internal transparent membrane, of a gelatinous consistence. The globular cyst, which is commonly met with in the brain of sheep, causing the disease called "gid," differs from the echinococcus in having a number of vermiform appendages, each of which has suckers, and is named *cœnurus*.

476. The symptoms of the above entozoa are so obscure that it is utterly impossible to prognosticate their presence; and they are only alluded to here, in order to guard against the prevalent notion that worms are only met with in the intestines, so that when by chance it is asserted by the medical attendant that an hydatid or some other rare entozoon has been discovered, the fact is altogether disputed, as being impossible. It is, therefore, better that the truth should be known; although in other respects it may be utterly useless.

CHAP. XXI.

MALIGNANT DISEASES.

SECT. 1.—PECULIARITY OF THESE DISEASES.

478. CERTAIN GROWTHS which occur in the body are peculiar in this respect, viz., that they are composed of cells which have a rapid power of increase by multiplication, and which have no tendency to be converted into any of the natural tissues of the body. Hence it follows that, when one of these growths (of which cancer is the most common example) takes root in the body, it grows by obtaining its nourishment from the blood-vessels of the surrounding parts, which it destroys partly by pressure and partly by robbing them of their nutritive fluid, the blood. There is a strong similitude in these malignant growths to the low forms of fungoid vegetation, which develop themselves as parasites on the bodies of the higher orders of plants, and also in animal bodies. And as these are capable of being propagated by seed conveyed in any way to the intended *habitat*, so in man it appears probable that the same mode of development takes place through the blood, which seems to be the medium of distribution of the poisonous germs, whatever they may be; since we find that, when a malignant growth has once shown itself, it is likely to break out in fresh places, even if the original tumour is entirely removed by the knife. There are three kinds of malignant growths—1st, *hard cancer;* 2nd, *soft cancer;* and, 3rd, *gelatiniform cancer;* besides which, there is also the disease known as melanosis, which is not generally considered malignant, though incapable of cure.

SECT. 2.—HARD CANCER.

479. SCIRRHUS, OR HARD CANCER, is a diseased growth of a hard and almost cartilaginous substance, when cut into before it has begun to soften, closely resembling an unripe pear in appearance. The pain experienced is most severe and of a lancinating character, and is one ground of distinguishing it from other diseases. In the early stage the sensation, on examining the tumour in a case of external cancer, is somewhat similar to what would be experienced, if a potatoe full of eyes were covered with several layers of wash-leather, the nodules of the disease a good deal resembling the undulating surface of the root. At first it is indolent, and often free from pain for a long time, so that the patient does not notice its existence; but after a certain time, the peculiar pain above described is felt at intervals, which gradually diminish in length, until at last the pain is almost constant, though varying in severity. The tumour slowly enlarges, and from being moveable becomes attached to the skin and adjacent parts; portions of it soften and ulcerate, and at last an open cancer is produced. The resulting ulcer enlarges by slow degrees, invading the surrounding parts; its edges are thick, jagged, hard, and strong, while the centre is comparatively soft, and eaten into irregular hollows. There is a thin bloody discharge, which irritates the surrounding skin. Before it reaches this ulcerative stage, the absorbent glands nearer the heart than the tumour inflame and harden, and gradually take on the same growth. In very rare cases the whole diseased mass sloughs away, leaving a healthy sore which heals, and the patient is cured.

480. Along with this local disease there are also certain constitutional symptoms, which by some are said to be only its consequences, but which most probably are concerned in producing it. The patient is languid and emaciated, with a leaden or wan complexion and a bad digestion. It appears as if there were a *cancerous cachexia*, which, like the scrofulous, precedes the disease with which it is connected.

481. SCIRRHUS may be known from

other swellings by the strange hardness of the tumour, by its lancinating pain, and also by the existence of the cancerous cachexia as indicated by the general appearance, as well as the age. This form of disease very rarely shews itself before thirty.

482. It attacks the female breast and uterus, and also the testis of the male; and in either sex it may occur in the skin, stomach, and liver, as well as in rare cases in other parts of the body.

SECT. 3.—SOFT CANCER.

483. MEDULLARY SARCOMA, *fungus hæmatodes*, *encephaloid disease*, and *soft cancer* are various terms used for a disease which commences as a *soft* rounded elastic tumour, free from severe pain, and is attached to the surrounding parts with which it is blended at its circumference. It grows rapidly, and is full of blood, so that the skin covering it soon becomes purple, and the veins around full and tortuous. After a time a throbbing pain is felt, but not nearly so severe as that of scirrhus, the tumour points and ulcerates, discharging a bloody fluid, and a fungus, which grows rapidly, shoots up from the opening, and from its surface a fluid is poured out which is sometimes serum slightly stained with blood and pus, or sometimes blood itself in large quantities. The absorbent glands suffer in the same way as in scirrhus.

484. THE CONSTITUTIONAL SYMPTOMS are exactly like those of scirrhus.

485. SOFT CANCER chiefly attacks the lungs, testes, kidneys, spleen, eyes, and brain. The disease is also generally of this kind when a second attack shews itself, after the removal of a scirrhus tumour by the knife.

486. It may be known from scirrhus by the absence of hardness and lancinating pain, by its quicker growth, and larger size, by its being more full of blood, and more inclined to bleed, and by its attacking persons of all ages.

SECT. 4.—JELLY-LIKE CANCER AND MELANOSIS.

487. JELLY-LIKE CANCER is a rare disease of a decidedly malignant character, and somewhat resembling a compressed bunch of white grapes. It is met with chiefly in the abdomen, and often in conjunction with the two first varieties.

488. MELANOSIS is a deposit of black or brown pigment in masses, chiefly in the cellular membrane. It is attended with a cachectic habit, and is wholly immoveable, returning again and again, if excised by the knife. It is not generally considered malignant, but is a mere deposit from the blood, without any tendency to grow by the addition of fresh cells.

CHAP. XXII.

DISEASES OF THE EYE, EAR, NOSE, MOUTH, &c.

SECT. 1.—DISEASES OF THE EYE.

489. THE EYE is subject to inflammations of the same character as other parts of the body; but as the apparatus is a very delicate one, and is rendered inefficient by any obscurity in its transparency, it is doubly necessary to guard against such an unfortunate result. Many of its diseases require very long practice to distinguish them; and, therefore, only those will be here described which are tolerably distinct. They will also be divided into those of the parts around the eye, and those of the ball itself.

SUB-SECT. A.—DISEASES OF THE EYELIDS, AND PARTS ADJACENT TO THE EYE.

490. A STYE is a small boil at the edge of the eyelid.

491. REDNESS OF THE EDGE OF THE LIDS is produced by inflammation of a number of small follicles or ducts which open upon their edges. This may be either acute or chronic.

492. The inside of the lids is often red and *rough*, or in a *granular condition* from chronic inflammation.

493. Occasionally the hairs grow inwards, and irritate the eye (*trichiasis*).

494. ENTROPION is an inversion of the edges of the lids, so as to cause the lashes to rub against the eye-ball. The reverse of this is *extropion*, in which case the inside of the lid is exposed, and consequently irritated and inflamed.

495. In consequence of palsy from disease of the nerve supplying the muscle which raises the upper lid, that part drops, partially or entirely, and the disease is called *ptosis*.

496. ENCYSTED TUMOURS of small size, and *nœvi*, are very common about the eyelids, as also are abscesses after erysipelas or small-pox, or any other inflammation extending to the cellular membrane, which is very loose about the eye.

497. THE TEARS being constantly secreted in considerable quantity by the lachrymal gland, which pours them out upon the surface of the eye, it is necessary that they should be as regularly carried off; and this is effected by a tube which leads down to the nose (*nasal duct*) from the inner angle of the eye. This tube opens from the inner edge of each eyelid by a small and almost invisible duct, the two joining together to form a small bag (*lachrymal sac*), which afterwards becomes the nasal duct. If, therefore, any of these parts become inflamed and stopped up, the tears, instead of taking their usual course, run over the cheeks. Sometimes the small ducts are closed by inflammation, or they do not act properly from original malformation. At others, the sac inflames and fills with pus, which is then discharged by ulceration through the skin, forming what is called a *lachrymal fistula*; or, lastly, the obstruction may be in the *nasal duct* alone.

SUB-SECT. B.—DISEASES OF THE EYE-BALL.

498. COMMON ACUTE OPHTHALMIA is confined to the conjunctiva, which is the external covering of the front of the eye. It is characterised by a smarting sensation, and a feeling as if dust was in the eyes, with stiffness and redness of the part called "the white." The red vessels are distinctly seen on this part; and if the eye is touched, they may be seen to move *with* the surface, instead of remaining stationary as in the deep seated inflammation.

499. CHRONIC OPHTHALMIA is marked by a slight degree of the above symptoms, but seldom attended by the feeling of dust.

500. PURULENT OPHTHALMIA does not often occur in this country, except in new-born children, in whom it is very common, and comes on a few days after birth, with swelling and redness of the lids, which stick together firmly by the drying at their edges of the thick pus which is secreted, and which often collects to the extent of a quarter of a teaspoonful behind. There is great difficulty in getting the lids open to see the eye; but when this is effected, the whole surface of it, as well as the lids, is of a bright scarlet and swollen, so as to stand up above the level of the cornea. The disease goes on rapidly, and if neglected, the cornea sloughs or becomes permanently opaque—in either case causing total blindness. It is caused by any irritating matter getting into the eyes, or by exposure to a cold draught of air.

501. STRUMOUS OPHTHALMIA generally attacks children under eight or ten years of age, but is occasionally met with in older persons. The *symptoms* are a peculiar intolerance of light, the lids being spasmodically closed on the eye being opened by force in presence of light. The conjunctiva is sometimes universally inflamed, at others it is only partially so, and that in the immediate neighbourhood of one, two, or three, little *pustules*, which are each seen at the end of a red vessel. The existence of these pustules sometimes gives it the

name of *pustular ophthalmia*. It attacks weakly and scrofulous children, and if treated like any ordinary inflammation, is very obstinate, but soon yields to appropriate remedies, unless it is complicated with internal mischief.

502. THE CORNEA IS SOMETIMES ULCERATED, and then the whole surface, except a thin and firm internal layer, gives way and is removed, leaving a depressed and slightly rough ulcer, but still transparent. These sometimes burst, and the eye is destroyed.

503. IF LEAD OR MERCURIAL APPLICATIONS are applied too long to ulcers of the eye, a part of their substance is retained, and opacity is the result; or if *nitrate of silver* lotions are used for weeks together, even without ulceration, the "white" of the eye becomes stained of an olive hue.

504. THE MIDDLE OR SCLEROTIC COAT of the eye is subject to rheumatic inflammation, which is known by severe pain of the eye and aching of the bones around it, aggravated at night, and accompanied by fever. In this kind of inflammation the red vessels of the eye cannot be rolled about, but remain stationary if the lids are stretched.

505. WHEN THE IRIS is inflamed, the eye suffers intense pain, and there is some degree of intolerance of light, but not such as to cause spasmodic contraction of the lids. The coloured part of the eye looks muddy, and spots of white or yellow are thrown out upon it. There is a good deal of redness, which is general, and with a pink zone round the cornea. It is a very formidable disease, soon producing irreparable mischief if neglected.

506. CATARACT is an opacity of the crystalline lens, and is indicated by a whiteness in the situation of the pupil, immediately behind which is the lens. In the early stage, it is scarcely visible from its small extent. It may be *hard* or *soft*, or the opacity may be confined to the *capsule* in which the lens is fixed.

507. GLAUCOMA is a peculiar disease of the internal parts of the eye, causing blindness, without opacity of the lens or paralysis of the nerves. It is characterized by a greenish brown hazy appearance of the pupil, which contracts sluggishly, and is more dilated then natural.

508. AN INFLAMMATION occurs in the innermost of the three principal coats of the eye (*the choroid*), and is known by the dull heavy pain which accompanies it, and by a bulging of parts of the white of the eye, in the centre of each of which prominences the colour is blacker than usual.

509. DROPSY occurs in the aqueous and vitreous humours, when the eye enlarges and the sight is lost.

510. FLOATING OBJECTS (*muscæ volitantes*) are seen in weak eyes, and especially in dyspeptic subjects, and those who are liable to congestion of the brain. They appear as floating black specks or chains, and are peculiarly likely to attack those who are much engaged in literary labours.

511. AMAUROSIS is a *paralysis of the optic nerve*, depending either upon disease of the nerve, or of the part of the brain with which it is connected. The blindness varies according to the extent of the disease, and usually comes on very gradually, with variations of colour or visions of *spectra*, or floating objects of any kind. The pupil is invariably dilated, and contracts very slightly, if at all, on exposure to light. It is sometimes only temporary, and depending upon the poison of retained bile in disorders of the liver or stomach.

512. SHORT SIGHT results from too convex a formation of the cornea, as *long sight* is caused by the reverse.

513. SQUINTING is produced by an irregular contraction of the muscles of the eye, which are chiefly four—one on each side, one above and one below, and each attached round the transparent cornea. If, therefore, one of these is permanently more liable to contract than the others, it keeps the eye turned more in its direction than it ought to be. Thus the squint is either internal or external, or it may be downwards or upwards; but these last are not very common, and not so much noticed when they do occur.

514. CANCER often attacks the eye

and destroys it, without any remedy but extirpation

SECT. 2.—DISEASES OF THE EAR.

515. THE EAR is subject to a variety of diseases, which are, however, not so easily made out as those of the eye, because the organ is more completely concealed. Several will be here omitted, as too obscure for general observation.

516. A YELLOW DISCHARGE from the passage to the ear is a very common disease in delicate, and especially in scrofulous, children. It generally begins with feverishness and intense pain in the ear, often accompanied by a swelling of the glands of the neck. After a day or two, a discharge suddenly makes its appearance, at first often stained with blood, and then the feverish symptoms, as well as the pain, usually disappear. The passage is swollen and red, and the surrounding skin is apt to inflame from the irritation of the discharge. It is either an inflammation of the membrane lining the passage, or an abscess which has formed beneath it, or sometimes in the cells of the bone behind the ear (*mastoid process*). Sometimes the above discharge is caused by the presence of a bean or piece of slate-pencil, or other substance, which has been forced into the passage by the child.

517. THE WAX of the passage which is a natural defence, in some persons is apt to accumulate, from being too hard in its nature.

518. A POLYPUS in the passage to the ear is by no means a very uncommon disease. It is a whitish-yellow, jelly-like growth, which is produced from the lining of the ear. *Fungous granulations* also sometimes shoot up from sores on the membrane, and are of a reddish hue, by which they may be known from *polypus*.

519. NERVOUS EARACHE, in which there is no inflammation of the ear, but only a peculiar condition of its nerve, of which we know nothing, is marked by fits of excruciating pain in the ear, shooting over the face and up the temple. It may be distinguished from inflammation of the internal ear by the suddenness and intensity of the pain, and by the absence of all throbbing, as well as fever; also, by its coming and going at intervals.

520. INFLAMMATION OF THE INTERNAL EAR may be suspected when the pain is very severe, but *persistent*, and when, in addition, it is increased by coughing, sneezing, or forcibly holding the breath. The pain is generally worst at night, and the patient hears unnatural noises when the head is on the pillow. The disease is, however, too obscure for any but an experienced practitioner to decide upon.

521. CHRONIC INFLAMMATION is very common as a cause of deafness; but here also the ordinary observer will do well to trust to additional help.

522. DEAFNESS may be either the result of inflammation, which ends in thickening of the membrane, or in loss of mobility in the small bones of the ear, or in destruction of the mechanism of that organ, including the *membrana tympani;* or, it may be of a nervous character, and depending either on some obscure disease of the nerve of hearing, or of that part of the brain from which it is derived; or lastly, it may result from a blocking up of the tube leading from the mouth *(eustachian tube)*, by which the air is prevented from freely vibrating in the interior of the ear. It is, however, so difficult to diagnose these several affections, that I cannot recommend my readers to make the attempt.

SECT. 3.—DISEASES OF THE NOSE.

523. BLEEDING FROM THE NOSE (epistaxis) has already been noticed at par. 427.

524. FOREIGN BODIES, such as beans, beads, &c., are equally likely to be passed into the nose as into the ear, and cause a similar degree of inflammation.

525. THE MUCO-PURULENT discharge, which accompanies "a cold," is the result of acute inflammation of the lining membrane of the nose, and cavities connected with it. But there is a *chronic inflammation* of this membrane, which is very common in scrofulous children, and is indicative of weakness. Besides which, in some cases, a foul stinking

discharge is met with, which is caused by some unhealthy ulceration, or disease of the bones: it is scientifically called *ozœna*, and is often very obstinate.

526. POLYPUS OF THE NOSE is more common than that of the ear, and may either be of a simple character, arising from a diseased growth from the lining membrane, which shows itself in the form of a jelly-like bag, or it may be malignant, and is then harder, more fungoid, and inclined to bleed. Great care should be taken not to confound the two, as if malignant, the polypus is far better left alone.

SECT. 4.—DISEASES OF THE MOUTH.

527. HAIR-LIP is a congenital defect, and is merely an error of nature in properly uniting the two halves of the body. It is either *single*, in which there is one slit of the lip, or *double*, when there are two, and in this latter case the bone is also generally implicated.

528. CLEFT PALATE is a similar defect in the roof of the mouth.

529. RANULA is a watery swelling under the root of the tongue, from a blocking up of the duct of the salivary gland situated there (sublingual gland).

530. CANCRUM ORIS, or *gangrenous erosion of the cheek*, is a foul sloughing affection of the cheeks, which occurs chiefly among the ill-fed children of manufacturing towns. It appears to arise from debility, caused by improper food, and the want of fresh air; and it is very apt to follow measles, scarlet fever, and other similar diseases of childhood. It commences as a shallow ulcer on the inside of the cheek, with a peculiar ash-coloured surface, and black edges. The face is swollen, the breath fetid, and the saliva is mixed with blood. As the disease proceeds, the surrounding parts mortify, and the cheek and gums are often destroyed, while the teeth drop out, typhoid symptoms show themselves, and the poor little patient sinks exhausted. The constitutional symptoms are those of disorderd stomach and bowels, with low fever, and rapid feeble pulse. It is sometimes mistaken for the effects of mercury, but the circumscribed nature of the ulcer, and its confinement to one side of the mouth, sufficiently mark its difference from that accidental consequence of mercury.

531. When a child is born with the *frenum* (or little bridle of mucous membrane under the tongue) too short, and carried too forward also, it is said to be "tongue-tied"—a formation which is very common, though perhaps considered more so by the old nurses than it really is, as in every case a child which will not readily suck from some mismanagement is accused of being tongue-tied.

532. ULCERS OF THE TONGUE from carious teeth are very common. *Malignant* diseases also of the tongue, lips, &c., are sometimes met with.

533. THE TEETH AND THEIR PRODUCING ORGANS are subject to various diseases. In the first place, they are often not secreted with a proper amount of enamel, and they are then soon worn down or broken off; or they are formed of an irregular shape, or are arranged in an unnatural and unshapely manner; or the child is too weakly to bear the demands on its system, caused by the secretion; or the process of absorption carried on in the gums, in order to allow of the teeth being "cut," is unhealthy in its character, and attended with irritation of the nervous system, as marked by fits or by general fever. But, besides these diseases attending upon the formation of the teeth, there are others connected with their decay after they are formed (see pars. 281, 282).

534. TOOTHACHE may be the result of three different conditions—1st, the fang of the tooth may be *inflamed;* 2nd, the body may be *decayed* from caries; and 3rd, the nerve of the teeth may be affected, constituting what is called *neuralgia*.

535. INFLAMMATION OF THE FANGS of the teeth, may be either of the soft membrane covering the fang, and interposed between it and the jaw, or it may commence in the central cavity. In either case the pain is severe, and the tooth is tender when touched, or when cold is applied to it. It is also loose in the socket, and often so much so as to lead to the idea that it will

come out. If the inflammation is not subdued, matter forms, or the membrane becomes thickened permanently, and then, though the first attack subsides, it is sure to return on the slightest "cold." If matter is formed, it shows itself after a time by the side of the tooth in the shape of a gum-boil, and very often the tooth dies and comes away.

536. WHEN THE BODY OF THE TOOTH IS CARIOUS, the disease is often not discovered until the central cavity is exposed, when the pain, on contact with food, is intense, and toothache in its most violent form is experienced, but seldom at first lasting long. After a time, however, it becomes almost constant when the cavity is large. Nevertheless, if the teeth are examined carefully, long before this cavity is exposed, a small whitish or sometimes black speck may be discovered, usually on the top of the crown in the double teeth, and below the surface of the enamel, which is removed. In this stage, the art of the dentist is of great service, and no time should be lost in calling in his aid. It is always the better plan to have the teeth examined regularly every six months, in all those who wish to preserve what they have, as by these means the slightest defect is detected, and the appropriate remedy at once applied.

537. NEURALGIC TOOTHACHE is distinguished by its paroxysms coming and going suddenly, without contact of food or other irritant cause. It may show itself in a jaw of which all the teeth are perfectly sound; but as a completely perfect set is not very common, it is more usual to find it attacking those who have one or more carious teeth.

538. RHEUMATIC INFLAMMATION of the jaw is not uncommon also, with or without carious teeth. It flies about from one part to the other, and can only be known from neuralgia by the tenderness of the part which is attacked by it.

539. COLLECTIONS OF TARTAR about the teeth are very usually met with, and are the result of the want of care in cleansing the teeth with the brush. This is a very frequent cause of decay, and of that inflammation of the fang which so often ends in the death of the whole tooth (par. 535).

540. SPONGINESS OR SCURVY OF THE GUMS appears to be a passive congestion of the vessels of the part, caused sometimes by the pressure or poisonous nature of the accumulated tartar, or very frequently by the state of the blood generally. The gums are spongy, and inclined to bleed on the slightest touch. They recede from the teeth, swelling outwards; and being exceedingly tender and inclined to smart on the contact of any but the mildest food. At last the teeth are left quite alone, and finally fall out dead, though undecayed by ordinary caries.

541. Sometimes a portion of gum grows up over a tooth, and intervenes between it and its opposite neighbour. This is not uncommon in a slight degree; and when very marked, it constitutes a very painful affection, and should at once be attended to.

CHAP. XXIII.

THE DISEASES PECULIAR TO WOMEN.

SECT. 1.—PECULIARITY OF STRUCTURE AND FUNCTION.

542. Independently of the greater tendency to particular diseases which exists in each sex, and which has been remarked in considering the nature of hysteria, anæmia, and certain forms of what are called nervous diseases, there is also in the female sex a class of diseases which is altogether confined to it, inasmuch as the organs which are the seat of them do not exist in man—being the ovaries and the uterus, with their appendages concerned in the propagation of the species. If these are not maintained in health, the offspring will be deficient in all probability in some point or other; and yet it is impossible to do this without attending to the health of the whole body; so that it is doubly important to take care that our females are brought up in the full possession of their mental and bodily powers—firstly, for their own sakes, and secondly, for those of their descendants. For this purpose, it is necessary to regard them in two stages of existence—viz., in the single and the married state—and to take especial care of them in both. Up to the age of puberty, there is little difference constitutionally between the boy and the girl, although in disposition and habits many slight points of distinction may be observed. But after that age the girl begins a new life, and is gradually fitted by nature to assume her maternal duties. In this country the uterine secretion or menstruation commences on the average at about the age of fourteen, sometimes but rarely at twelve, and again as late as sixteen or even eighteen. The period of commencement depends greatly upon the bodily precocity of the child, and upon the healthy condition of all the functions, especially those of the circulation and nutrition which mainly govern all the secretions. If all is quite healthy through life, the process goes on regularly every month for about thirty years, interrupted only by pregnancy and suckling, or by some accidental cause, such as fever, cholera, or any other lowering disease. Anything which interferes with the general health is found to affect this secretion, and therefore its imperfect performance may be looked on as a proof of some defect, though like many others it may exist for a short time without any serious derangement. Much injury has unfortunately been done, and still continues to be done in this country from the mystery in which this process is enshrouded. Girls are made to consider what God has given them a mark of shame, and even to go so far as to endeavour to repress the appearance of the secretion at its proper time, by means of cold applications to the feet or hips. No one would advocate the indelicate exposure of these matters; but at the same time it cannot be right, that such a feeling should exist as would lead to the above most dangerous practices. Surely there can be less reason for this feeling than in the case of the daily relief of the bowels, which is far more humiliating to our human nature, but which all must submit to; and I confess that I regard with extreme sorrow and regret (however I may esteem the motives of delicacy which lead to it), the mysterious state of ignorance in which girls are often brought up by their mothers of the various duties which the Almighty has destined them to perform. "To the pure all things are pure;" and, with a full comprehension of her duties, no mother need hesitate to impress upon her daughter the propriety of taking extra care of herself at those periods of her existence when she is particularly liable to suffer from inflammations and congestions of the important set of organs which we are now considering. If this duty were more fully performed, many young females would escape from the difficult task of learning for themselves

what they must know some time or other, and what they often pay a heavy penalty in acquiring in the best way they can.

SECT. 2.—DISEASE OF SINGLE WOMEN.

543. ANŒMIA and CHLOROSIS have been already described at page 132, the former being common to both sexes, though from her habits more usual in the female of this country.

544. AMENORRHŒA is the condition which exists, when the periodical secretion is not performed at all. It may be either from its not being *secreted*, or from its being *retained*, in consequence of some mechanical impediment which sometimes exists. In this last case, there is a swelling of the abdomen, which is sometimes very considerable, and has even, in some cases, gone so far as to be mistaken for pregnancy; pains in the back and legs are felt, and there is a feverish and languid condition with swelling of the legs and feet. Here the aid of a surgeon should without delay be called in, and he will at once afford the relief which nature requires. When the discharge is not *secreted* it may be either from too great a quantity and too gross a quality of blood, which causes congestion and even inflammation of the uterus, which consequently cannot perform its office of secretion; or it may arise from the state of anœmia or chlorosis described at page 132, in which the blood is so thin and diluted that nature refuses to reduce it still more by depriving it of the materials which are required for the periodical flow. It is, therefore, highly important to ascertain the precise cause of the absence of this important secretion, for the remedy which would be useful in the one case, would be highly injurious in the other. Fortunately, it happens that the general appearance affords a pretty sure guide, for the pale bloodless look of the anœmic or chlorotic girl cannot for an instant be mistaken for that of the plethoric and robust young woman, who is overdone with blood, and will often require to lose a part of it before the organs can assume their proper functions.

545. DYSMENORRHŒA is a disease which is attended with great pain at the periodical return of the secretion

546. IN MENORRHAGIA the discharge is too profuse, either from an original excess of blood in the system, which has established a drain for its relief that is continued too long, or from an original relaxation and debility in the uterine circulation, amounting to a species of *hœmorrhagic diathesis* (pars. 422—431).

547. FOR LEUCORRHŒA see page 165.

SECT. 3.—THE DISEASES INCIDENTAL TO PREGNANCY, PARTURITION, AND LACTATION.

548. ABORTION is the first and most serious danger in the pregnant female, though the risk is not so much to herself as to her offspring, that is to say, if proper care is taken. The term abortion and miscarriage are applied indiscriminately to all cases in which the uterus expels its contents before the sixth month, after which the child *may* be born alive, although *prematurely*. The signs of a threatened abortion are a sense of uneasiness and weariness, with aching, and afterwards pain of the back. If these do not go off, acute expulsive pains similar to those of labour come on, and the ovum is expelled, the time which is occupied varying immensely, and also the intensity of the pain, and other concomitant symptoms.

549. A VARICOSE CONDITION of the veins of the legs is a very common attendant upon the latter months of pregnancy, arising from the pressure on their trunks in the pelvis. It is sometimes very distressing, and the veins are so dilated as to be irretrievably rendered varicose.

550. THE OCCURRENCE OF SICKNESS is almost universal in some degree, but it varies from the slightest nausea, occurring only in the early months, to an incessant vomiting, which will not allow any kind of food to be taken without part of it, if not all, being returned.

551. CONSTIPATION, also, almost always accompanies the latter part of the time of pregnancy, owing, in great

measure, to the pressure exerted upon the lowest bowel.

552. THE VARIOUS ACCIDENTS connected with parturition are not within the scope of this volume, excepting one or two which may require instant attention on the part of those who happen to be in the way, and which will be duly noticed in the chapter on the *treatment* of the diseases of women.

553. PUERPERAL CONVULSIONS sometimes occur during parturition, or immediately after. They may be either of the nature of *hysteria*, *epilepsy*, or *apoplexy*, all of which are apt to occur at these times. In hysteria the body is but slightly contorted, the insensibility is not complete, there is no frothing at the mouth, nor biting of the tongue, and after the fit is over the patient recovers her usual state. In *epilepsy* occurring at this time, the symptoms are very nearly the same as in ordinary cases, described at page 147, but the peculiar "aura" is seldom felt, and there are often no premonitory signs whatever. The frothing at the mouth is very characteristic of the disease. The danger is very much greater than in ordinary epilepsy, and the attacks seldom cease for many hours together until the labour is completed, the patient remaining in the intervals of the convulsions in a state of half stupor. It often goes on to produce apoplexy or mania. In *apoplectic convulsions*, which seldom occur excepting towards the latter stages of labour, if not preceded by epilepsy, there is generally pain in the head, which is flushed, and the eyes injected. The convulsion is very slight, the body being only thrown about for a very short time, and then the patient becomes comatose, breathing with stertor, and the whole body being flaccid. Death generally takes place, the pulse becoming slower and weaker, and the respiration more feeble.

554. PUERPERAL FEVER is the most fatal disease which attacks women in child-bed, and occurs epidemically, especially in lying-in hospitals. It is supposed by many to be highly contagious; and, in proof of this, numberless cases are adduced in which it has attacked the patients of one man, all others being exempt at the time. The question, however, is by no means settled, but it is so probable that it is capable of being communicated in this way, that great caution should be exercised by those who pass from a case in which it has occurred to other pregnant women, or women recently delivered. It is a fever of a very high character, attended with inflammation of the serous membranes, as well as often of the womb itself, and of its veins and absorbents. These complications occur with varying conditions of the general system, for there may be high inflammatory fever, or it may take a low or typhoid character. *Great tenderness of the abdomen*, with pain at all times, is the most constant and alarming symptom, and which should, at all times, call for medical advice without loss of time. If with these there are also a fulness and tension of the abdomen, great anxiety of countenance, a cessation of the proper secretions, vomiting and hurried respiration, with a furred tongue, the danger is great, and no time should be lost. Such a concurrence of symptoms marks a high degree of inflammation, constituting what by some would be called mere fever, and by others *puerperal peritonitis*. In some cases, however, severe pain may come on without inflammation. Here there is no fever, the temperature of the skin is but slightly increased, if at all; the countenance is not expressive of anxiety, and the pulse is very compressible, though rapid. Nevertheless, it takes some skill to distinguish this spurious kind of disease from the true peritonitis, and no one should make the attempt without proper experience and knowledge of the disease.

555. MILK FEVER comes on about the third day after parturition, with pain and throbbing in the temples, flushed countenance, pulse frequent, full, and hard, and a hot dry skin, thirst urgent, and tongue dry and furred. Even in healthy subjects there is more or less of this fever, which seems to be an effort of nature to rouse

the hitherto dormant mammary organs to secrete a proper quantity of milk. If, however, it is not kept within due bounds, the arterial action is too high, and instead of the milk being secreted in proper quantity, there is none. Sometimes, also, the milk formed in the ducts of the breasts is not removed from them by the sucking of the child, or by any other mode of relief, and the consequence is, that the fever is kept up. Great care is therefore necessary, on the one hand, to moderate the action of the heart and arteries within the bounds which are calculated to allow of secretion, and, on the other, to relieve the local congestion in the natural mode. This, however, will come under the *management of the lying-in room*.

CHAP. XXIV.

ON THE EFFECTS OF POISONS.

SECT. 1.—GENERAL REMARKS.

556. THE ORDINARY DEFINITION of poison is a substance which, when given or taken into the body in small quantities, acts injuriously upon it; but this is a very imperfect description of the nature of poisons, some of which require a considerable quantity to be swallowed before any injurious effect is produced, and yet will even cause death. The fact is, that numberless substances are poisonous in *some dose*, while they are harmless in others, and the common sense of mankind must always decide as to the poisonous nature of any doubtful substance, or as to the dose in which it becomes so. So also an article may be poisonous to most men, and yet from constant use it may be almost inert in others, as is often seen with regard to opium, which is taken by many people regularly in doses which would kill half a dozen ordinary individuals unaccustomed to its effects. On the other hand, very minute doses will occasionally act in a poisonous manner upon constitutions which are peculiarly affected by them, which is said to be owing to *idiosyncrasy* (see page 3).

557. THE VARIOUS POISONS are generally arranged according to their effects, which may be either *narcotic* or *irritating*, or a mixture of the two, and called *narcotico-irritating*.

558. IRRITANT POISONS when swallowed speedily occasion vomiting and purging, followed by intense pain of the abdomen, and the usual signs of inflammation of the bowels (*enteritis)*, see par. 254. Some irritants are also *corrosive*, such as the strong mineral acids, the caustic alkalies, corrosive sublimate, &c., which produce an acrid and burning sensation in swallowing, extending down the gullet to the stomach. These produce their symptoms immediately on being swallowed, the mere contact with the mucous membrane effecting its destruction. On the other hand, the merely irritant poisons (including arsenic, carbonate of lead, cantharides, &c.) rarely show any effects for half an hour after they are swallowed. Corrosive sublimate is more rapid certainly; but it is partially corrosive, destroying the outer surface of the membrane, while it irritates and inflames the internal layers. All the corrosive poisons belong to the mineral kingdom, and most of the irritants—a few only being included in the vegetable and animal world.

559. NARCOTIC POISONS act in some peculiar manner upon the brain and spinal cord, the exact nature of which is beyond our knowledge. Their effects, however, are—headache, giddiness, paralysis, coma, and sometimes convulsions of a tetanic character.

They have no burning or acrid taste when swallowed, and they seldom give rise to vomiting or diarrhœa. The narcotic poisons belong to the vegetable kingdom, including among them certain gases, such as carbonic acid, &c., which is produced from charcoal and oxygen.

560. **The Mixed Poisons** acting partly as irritants, and partly as narcotics, have likewise a compound action, commencing as irritants and ending with narcotism. This class includes a large number of vegetables, such as nux vomica, monkshood, poisonous mushrooms, &c. Many of them have an acrid bitter taste; but they do not produce any sensation of burning after swallowing them.

Sect. 2.—Proofs of Poison having been taken.

561. As it is not always known whether or no poison of any kind has been swallowed, there is frequently a doubt as to the nature of the symptoms which present themselves. Many of them take effect in the course of a few minutes, such as prussic acid, oxalic acid, strychnine, but always depending upon the dose. Arsenic takes no effect for about half an hour, or from that time to an hour and a-half. Opium also requires the same period to develop its effects, while some of the vegetable poisons, such as the mushrooms, will remain in the stomach for many hours before they exert their peculiar influence on the animal economy. Phosphorus also has this same property of delaying its specific effects.

562. **In many diseases** poisons have comparatively little effect; thus, in cholera, dysentery, mania, and tetanus, very large doses of opium are often taken without any appreciable effect. So also in paralysis, strychnine has been given in doses which would inevitably cause death in a healthy person.

563. **The Circumstances which cause suspicion** of poison having been taken are—1st, the suddenness of the attack, when of a nature different from the ordinary diseases to which the human frame is liable; 2nd, its coming on within half an hour or an hour of food or medicine having been taken; or, in case of children, after they have been walking by themselves, where they could gather poisonous berries or mushrooms. The most difficult cases to distinguish are those in which some poisonous substance has been given instead of the proper medicine, either wilfully or by mistake, because in them the person poisoned is always suffering from some disease, or else the medicine could not have been necessary, and consequently the ordinary observer is greatly puzzled to know whether the symptoms are caused by the poison, or are due to the disease. There is here also another difficulty, inasmuch as the medicine being specially required, it has not like food been shared by the whole family, or by any part of them, as is the case with an ordinary meal. Here, as more than one will be sure to partake of the same dish or dishes as the sufferer has done, the existence of similar symptoms in them will confirm the supposition of poison being present, just as their absence will have the opposite effect. It so seldom happens that the same disease attacks two or more persons *at the same time*, that if such a thing does occur, it is tolerably safe to act upon the supposition that the symptoms are due to poison, though it may possibly ultimately turn out that an epidemic or infectious complaint is really the cause of them. Cholera, however, is almost the only disease which comes on with the rapidity which poison shows; and, therefore, excepting during the course of its ravages, the mistake can hardly be made.

Sect. 3.—Irritant Poisons.

564. **Concentrated Sulphuric Acid**, or *oil of vitriol*, when swallowed, immediately produces the following symptoms:—Violent burning pain, extending from the lips to the pit of the stomach. This is attended by straining and vomiting, which causes the discharge of a frothy matter, with volumes of gas, and shreds of membraneous-looking matter, mixed with dark coffee-coloured blood. The

lips and tongue, as well as the whole interior of the mouth, are swollen, and at first white, but soon becoming grey or brown. Speaking and swallowing are almost impossible, on account of the swelling, and of the mucus and froth which fill the mouth. Sometimes, however, the acid has been swallowed from a vial, and then the lips and front of the mouth may escape. Generally the outside of the mouth shows some indication of the acid, in the shape of brown spots. In a very short time the breathing becomes difficult and quick, from the swelling of the larynx; the pulse becomes quick, small, and feeble; the skin covered with a cold sweat; countenance livid, and expressive of dreadful suffering; and death takes place from exhaustion usually within about twenty hours of the swallowing the poison.

565. Concentrated Nitric Acid, or *aqua-fortis*, produces the same effect as sulphuric, the only difference being that the external stains, if any, are yellow instead of brown.

566. Concentrated Muriatic Acid, or *spirits of salt*, will also have the same fatal effects as the two abovementioned, its stains being intermediate in colour between the two.

567. Oxalic Acid and *salt of sorrel*, also called *salt of lemons*, which are used for various domestic purposes, produce death, accompanied by the following symptoms. If oxalic acid is taken in the dose of half an ounce or an ounce dissolved in water, as it often has been in mistake for Epsom salts, a hot burning sensation is produced in the act of swallowing, with a sense of constriction of the throat, which is soon followed by vomiting. If the poison is much diluted, the acid taste is the only means by which its presence can be detected until a quarter of an hour has elapsed, when vomiting comes on, or it may possibly be delayed much longer. The matter thrown up consists of a greenish-brown fluid, mixed with more or less blood of a brown, or almost black colour. There is great pain at the pit of the stomach of a burning character, with cold clammy perspirations, and generally soon followed by convulsions and collapse. The brain is soon affected—a stupor coming on from which there is great difficulty in rousing the patient. The pulse is very small and irregular, and there is a numbness in the skin. The respiration is not affected so soon as in the mineral acids (see par. 564); but towards the last, it becomes irregular, and spasmodic, and, if the poison has been taken in a sufficient dose, death takes place from exhaustion. If, on the contrary, the constitution has time to rally, the ordinary symptoms of gastritis and enteritis (pars. 157 and 245) supervene, and by careful treatment, a slow recovery may be affected.

568. Pearl-ash in large doses may produce death; but the probability of its being given or taken is so small as scarcely to require notice here.

569. Ammonia is poisonous either in solution, or when its vapour is inhaled in a concentrated form. The *solution of ammonia* when swallowed produces all the symptoms of gastritis, with sense of heat and burning in the mouth and gullet. The difficulty of swallowing it from the pungency of its vapour will always, however, prevent this poison from being either given or taken very frequently; and the only probable cause is, when the *solution* is incautiously used as a means of stimulating the nose instead of the *solid sesquicarbonate*, in which case a portion may, from accident or carelessness, flow into the throat, and cause suffocation by spasm or inflammation of the larynx. The vapour of the *sesquicarbonate of ammonia* has been known to produce fatal results from inflammation of the larynx, brought on by holding it to a patient in a state of insensibility, as in fainting or epilepsy.

570. Arsenic, in its various forms of *white arsenic*, *orpiment*, *fly-powder*, &c., &c., is the most common of all the irritant poisons, partly from its tastelessness, and partly from the careless way in which it is sold and used. The symptoms vary according to the form and the dose of the poison, but they generally come on within half an hour of its being swallowed, though

cases have occurred in which a large dose has been taken without any symptoms appearing for many hours, varying from two, to ten, the longest recorded. In *full doses* a sense of depression, with nausea or vomiting and faintness, are experienced, together with an intense burning pain in the pit of the stomach, increased on pressure. There is often, but not always, a slight sense of burning in the back of the mouth and gullet. The ejected matters are generally mixed with bile, and sometimes stained with blood, or in other cases consisting of thick mucus, mixed with flakes of white matter, which is the arsenic itself; or if that substance has been coloured, according to the present law, then with the shade which it presents. Purging, proportioned in violence to the dose taken, soon comes on, attended with cramps of the legs, and often of the muscles of the abdomen. The vomiting and purging are usually almost incessant, and the straining is most painful and distressing. The pulse is small and weak, the skin covered with a cold perspiration, the respiration painful, owing to the tender state of the abdomen, and the countenance anxious in the extreme. Towards the last, coma makes its appearance, with paralysis or spasms of tho extremities, which resemble tetanus in their nature, though not so violent in degree. Death usually takes place in from eight hours to twenty-four; but it has been known to happen within two or three hours after the swallowing of the poison, and it may ensue after many days, or even weeks, of agony. In *small doses frequently repeated*, chronic inflammation of the stomach will ensue instead of the acute form of that disease; but the most remarkable symptom is the redness of the eyes, with intolerance of light, which, though exactly similar to ordinary ophthalmia, is not produced by any other chemical means. There is also very frequently an irritation of the skin, in the form of eczema or erythema, or sometimes resembling nettle-rash. Partial paralysis frequently follows the long-continued use of arsenic, and neuralgia almost invariably occurs to some extent. On the whole, however, the symptoms of slow poisoning are very obscure and difficult of detection. Externally applied, its constitutional effects are the same as of small doses given internally.

571. Corrosive Sublimate, or *bichloride of mercury*, is not often used as a poison, owing to its strongly acrid taste, which alike prevents its wilful and accidental employment. The symptoms are as follows, and they come on a very few minutes after it is swallowed:—a strongly metallic taste, coupled with a sensation of burning in the throat, and suffocating constriction in the gullet: violent pain in the stomach soon shows itself, followed by nausea and vomiting of stringy mucus, which is coloured white by the decomposition of the salt. The bowels are violently purged with intense griping, and the pain and tenderness of the abdomen are very marked. The tongue is white; skin cold and clammy; pulse small, quick, and intermittent; and the countenance is expressive of intense anxiety; the respiration is hurried, and after a short period of collapse death ensues from exhaustion. *If the doses of the drug are small* and frequently repeated, colicky pains come on, with general disturbance of the stomach and bowels, and almost always accompanied by *severe salivation*, which is the peculiar characteristic of mercurial poisons.

572. Calomel, Red Precipitate, and Vermilion, which is a *persulphuret of mercury*, are all sometimes liable to act as poisons, the symptoms being those of mild doses of corrosive sublimate, and salivation showing itself in the same way.

573. The Preparations of Mercury, like those of arsenic, act externally by absorption into the system.

574. Sugar of Lead, when taken in large doses, produces a burning or pricking sensation in the throat with thirst, soon followed by vomiting and colic. The pain is not constant, and is relieved by pressure. There is usually obstinate constipation; the skin is cold,

with great weakness, giddiness, and sometimes stupor. If the mouth is examined, in case death does not occur in forty-eight hours, a blue line will be observed in the gums around the teeth. If small doses have been swallowed, the symptoms are of the same nature as above indicated; but they are many days in making their appearance, and they are more severe than might be expected from the quantity swallowed at one time, owing to the effects accumulating, and the whole amount swallowed, even if spread over many days, producing the same effect as if taken at once. It appears highly probable that the injurious effects of this salt are not developed, unless it is converted into the carbonate by decomposition in the stomach.

575. CARBONATE OF LEAD produces exactly the same symptoms as those detailed above; but as it is generally absorbed from the surface, or swallowed in minute doses by contact of the unwashed hands of the painter with his food, they are not usually so severe as when large quantities of sugar of lead have been taken. *Painter's colic* is the form which they assume in this case, in which there is a considerable amount of spasmodic pain in the abdomen around the navel, relieved by pressure and by hot cloths. There is also a most obstinate constipation, thirst, loss of appetite, and general weakness and emaciation. The countenance looks pale and pasty, and the blue line on the gums is almost always visible. Paralysis of the extensor muscles of the fore-arm (*wrist-drop*) is a very common accompaniment of the employment of this poison.

576. RED LEAD produces the same symptoms as the acetate or sugar of lead.

577. BLUE VITRIOL, or *sulphate of copper*, speedily produces violent vomiting of matter, which is of a blue or bluish-green colour. Colicky pains are also felt, with constriction of the gullet, and other symptoms of acrid irritation.

578. VERDIGRIS, BRUNSWICK GREEN, and SHEEL'S EMERALD, or MINERAL GREEN are all salts of copper, which may be swallowed by children in mistake; or sometimes they are used as colouring matters in confectionery. Their effects are similar to those of blue vitriol, but not so acute, especially as regards the vomiting, which is often not produced.

579. TARTAR EMETIC, or *tartarised antimony*, when taken internally, is followed by a violent pain in the stomach; which soon ends in constant vomiting, profuse diarrhœa, and such excessive weakness as to cause fainting, especially if the recumbent position is not strictly maintained. The pulse is small and rapid, the skin cold and clammy; and if the dose is large enough, death ensues from the excessive prostration.

580. WHITE VITRIOL, or *sulphate of zinc*, produces pain in the stomach; and violent vomiting coming on almost immediately after it is taken, and soon followed by diarrhœa, it is not often fatal.

581. CHLORIDE OF ZINC, now much used as a disinfecting agent, is a strong poison; and as it is left carelessly about in many cases, it can scarcely occasion surprise that it has been swallowed by mistake, and in one instance wilfully given as a poison. It produces a burning sensation in the gullet, followed by a pungent pain in the stomach, great nausea, colicky pain round the navel, and general coldness of the body. In large doses, vomiting comes on very speedily, and collapse soon takes place, followed by death, with all the symptoms of exhaustion.

582. SAVIN exerts an irritant action, either when given in powder, or swallowed in the shape of infusion. It produces violent pain in the abdomen, with nausea, but not often vomiting, and strangury. In large doses it often causes intense inflammation of the peritoneum.

583. SPIRIT OF TURPENTINE, when swallowed by children in mistake for other spirits, &c., produces all the symptoms of intoxication, after having caused a hot sensation as it passes down the throat.

584. CANTHARIDES, or *Spanish flies*, when taken in substance, produce a burning sensation in the throat with great difficulty of swallowing, followed

by pain in the stomach, nausea, and vomiting of bloody matter. Great thirst soon shows itself, and in a short time a severe pain in the loins is felt, with incessant desire to pass the urine, which is small in quantity and often bloody. The bowels are severely irritated and stools frequent, with griping and tenesmus, and the passage of large quantities of mucus mixed with blood.

584*a*. CARBOLIC ACID, from carelessness, has been swallowed by mistake. See APPENDIX.

585. FISH, and especially *shell-fish*, is very apt when at all stale to produce peculiar symptoms of poisoning, characterized by shivering, difficulty of breathing, cramps in the legs, swelling of the face, heat and itching of the skin, generally accompanied by nettle-rash. These are attended with vomiting, colicky pains and purging, together with thirst and a sense of constriction in the back of the mouth. These poisonous effects do not usually come on for some hours after partaking of the fish, but they have been known to occur within half an hour. Mussels seem to have a greater tendency to cause this affection of the system than other shell-fish, and apparently without being always in a putrid state, as they have even been followed by all the symptoms above noticed, when eaten alive out of the shells. Pickled oysters, salmon, and barrelled herrings have also been known to give rise to these symptoms of poisoning.

586. FRESH MEAT, especially *pork* and *veal*, are sometimes apt to produce vomiting and diarrhœa, with disturbance of the stomach, and general feverishness. *Sausages*, *black-puddings*, and all the varieties of *saveloys*, &c., have also frequently been accused of these disagreeable results; but it is somewhat difficult to ascertain how far they have deserved the bad character they have obtained.

587. GAME, when eaten in a "high" state, has also produced symptoms of irritant poisoning; but I believe that this has always been due to a particular condition, in which there is a great disengagement of carbonic acid gas, showing itself in air-bubbles near the bones, and giving a crackling sensation to the meaty parts when cut. Venison, mutton, and game, when merely high, however long they have been kept, so that there is no gas disengaged, will not, I believe, ever give rise to injurious effects.

SECT. 4.—NARCOTIC POISONS.

588. PRUSSIC ACID, or *hydrocyanic acid*, is the most energetic and rapid of all poisons, producing instantaneous death in most cases, and its effects being seldom delayed beyond one or two minutes. Its symptoms, when a *full dose* is taken, are perfect insensibility, with fixed and dilated pupils, convulsive respiration at long intervals, soon entirely ceasing, and the patient dying with slight convulsive actions of the limbs and body. In a *smaller dose*, it causes a weight and pain in the head, with confusion of ideas, giddiness, a quick but feeble pulse, and loss of strength, and, if fatal, ending with convulsions in about twenty minutes or half an hour.

589. THE ESSENTIAL OIL OF BITTER ALMONDS produces exactly the same effects as prussic acid.

590. OPIUM (juice of the white poppy) or its *tincture* (*laudanum*), or *black-drop*, or *Battley's solution*, or as *morphia and its salts*, or *Godfrey's cordial*, *Dalby's carminative*, *syrup of poppies*, &c., produces pretty nearly the same effects, varying, however, with the dose, which, if large, causes giddiness and drowsiness, followed by an irresistible tendency to sleep, and, finally, stupor and coma which end in death. At first it is tolerably easy to rouse the person out of his insensibility, but towards the last it becomes more and more difficult, and at last impossible. In small doses, and at first in all cases, the pupils dilate, but afterwards contract to a point, if the dose is large. Very often the stomach rejects opium by vomiting, and its poisonous effects are then only partially developed. The symptoms show themselves within half an hour after the swallowing of the poison, and death takes place in about six or eight hours, or, in some few cases, in much less time. In *young*

children the effects of opium are very uncertain, a small dose occasionally proving fatal; while, in many cases, they bear quite as great a proportional dose as the adult.

591. THE WOODY NIGHTSHADE OR BITTER-SWEET (*solanum dulcamara*) has a purple flower, and bears red berries, which have often been taken by children in mistake for fruit. The garden nightshade (*solanum nigrum*) bears a white flower and black berries. When eaten, the berries produce giddiness and trembling of the limbs, and in some few instances have destroyed life, with convulsions and coma.

591*a*. HENBANE (*hyoscyamus niger*) is commonly met with, but as it has not a tempting appearance, it is seldom eaten by children. It is used in medicine largely, and in that way an overdose may be taken. It is anodyne, and in full doses (15 to 20 grs.) powerfully narcotic.

592. ALCOHOL, when taken in very large doses, either in the shape of *spirits of wine*, or any of the ardent spirits sold as *brandy*, *gin*, *rum*, &c., produces all the ordinary symptoms of drunkenness, followed by total insensibility, coma, and death. When strong alcohol is taken, insensibility may come on in a few minutes, and death has followed very rapidly.

593. ETHER, in all its forms, produces very nearly the same effects as alcohol when swallowed. If inhaled, which is somewhat difficult to effect, from the irritation produced on the larynx, it has the property of destroying the sensibility to pain like chloroform, and in a sufficiently large quantity will cause death.

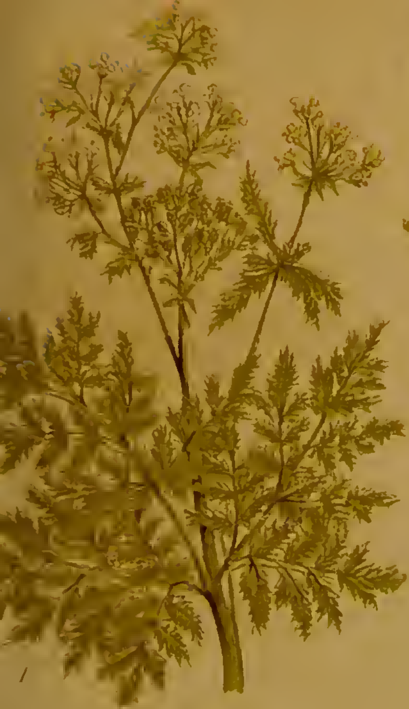
594. CHLOROFORM when swallowed is not a very active poison; inasmuch as four ounces have been taken into the stomach without a fatal result, though the symptoms were very violent, and resembled those of poisoning by alcohol. *When inhaled*, the patient rapidly becomes insensible, the pupils becoming dilated, the muscles flaccid, the breathing slow, and the pulse sinking considerably in power and frequency. If the inhalation is continued, the functions of respiration and circulation are entirely suspended, and as a matter of course death ensues; but by carefully moderating the action, pain may be suspended without danger to life in a healthy subject. It is, however, too dangerous a remedy to be idly played with, and should never be used, except by the regular practitioner of medicine, who ought in almost all cases to be able to foresee the probability or otherwise of its being injurious when inhaled.

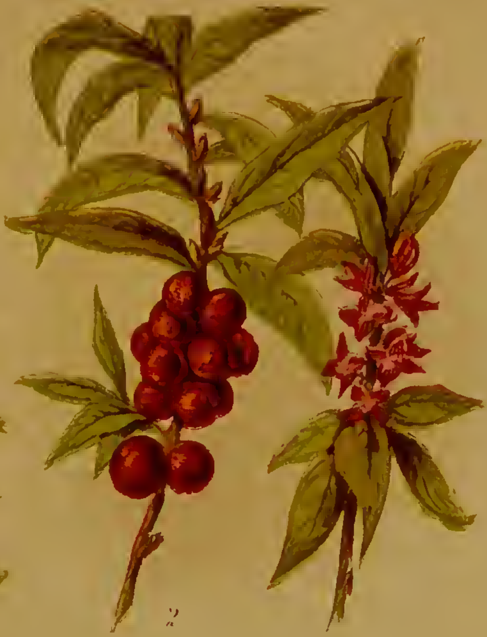
SECT. 5.—NARCOTIC IRRITANT POISONS.

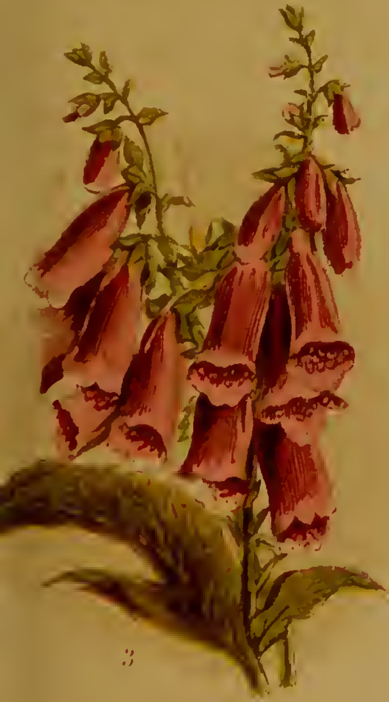
595. NUX VOMICA and STRYCHNINE, the latter of which is a preparation from the former, have a specific effect upon the spinal cord, producing tetanic convulsions, without coma or delirium, except in rare instances. Death takes place by suffocation, owing to the spasmodic contraction of the muscles of respiration, which prevent any inhalation of air. The *symptoms come on* about half an hour after the poison is swallowed, and death takes place within an hour afterwards—frequently in much less time. When *small doses* are administered for a long time, they at first produce no effect; but at last the power accumulates, and the peculiar tetanic convulsions show themselves, by which this drug can generally be detected with great certainty.

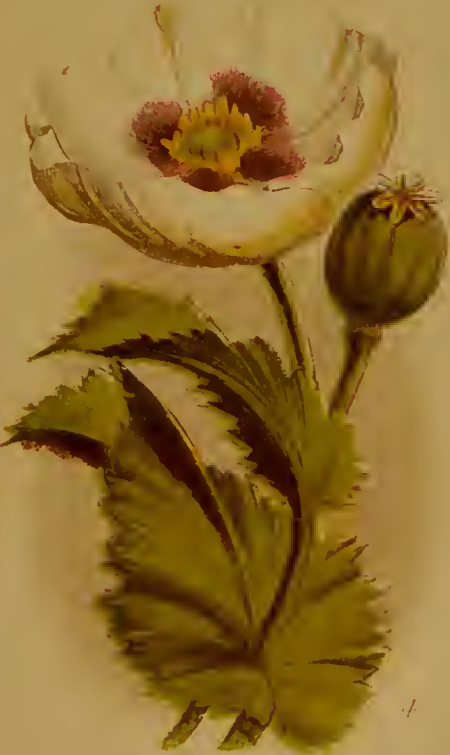
596. COLCHICUM, or *meadow saffron*, and *white hellebore*, are sometimes administered medicinally in rural districts in doses which turn out to be more than the system will bear. They produce violent pain in the stomach, followed by vomiting and purging, together with a rapid sinking of the pulse and general collapse, ending in death in a few hours.

597. DIGITALIS (*foxglove*) is a most powerful poison, either in large doses, if administered at once, or in small ones often repeated, its effects being cumulative. Its chief effect is on the heart, the action of which it reduces in a most remarkable manner; but it is attended also with restlessness, inflamed and reddened eyes, delirium,







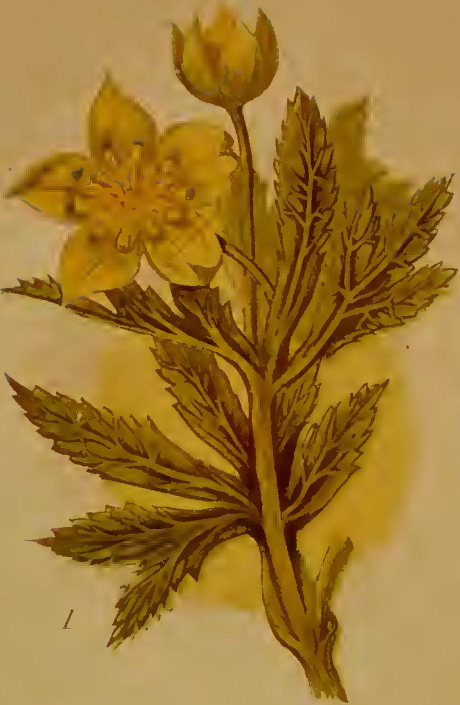


1. *Common Hemlock.*
Conium maculatum

2. *Common Mezereon.*
Daphne Mezereum

3 *Foxglove*
Digitalis purpurea

4. *White Poppy.*
Papaver somniferum.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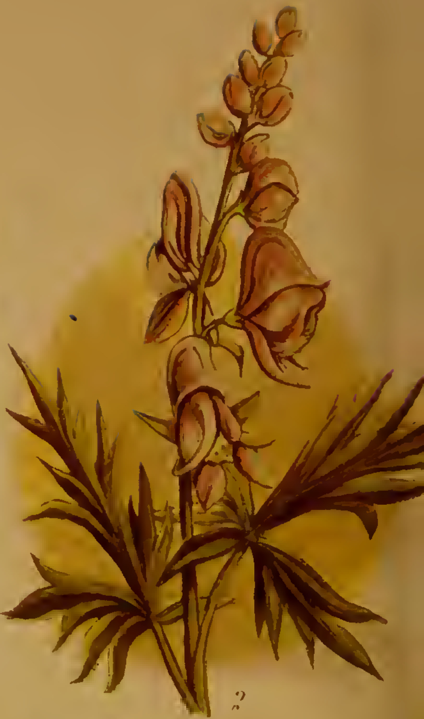
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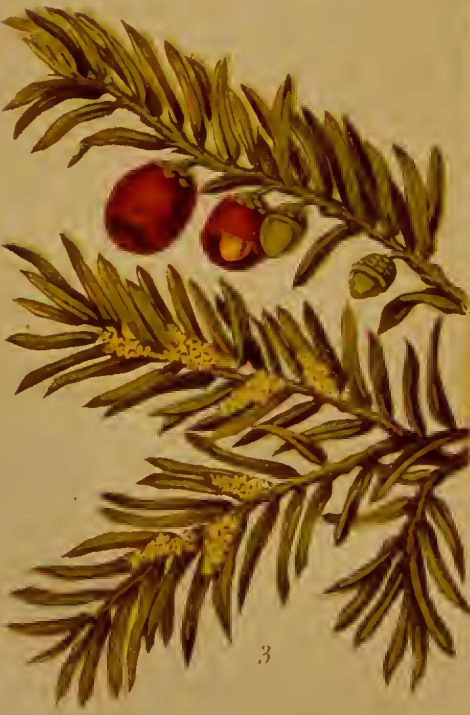
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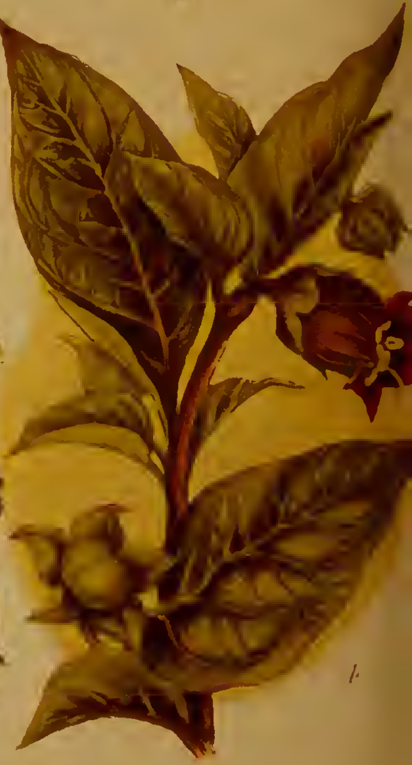
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1. *Green Hellebore.*
Helleborus viridis.

2. *Monk's Hood*
Aconitum Napellus

3. *Yew.*
Taxus baccata

4. *Deadly Nightshade.*
Atropa Belladonna

coma, and at last death from exhaustion.

598. BELLADONNA, or *deadly nightshade*, bears shining black berries, which often tempt children to eat them by mistake for fruit. The *symptoms* are giddiness, delirium, convulsions, and coma. Sometimes vomiting occurs, and then the effects may cease. The pupils are always greatly dilated.

599. COMMON HEMLOCK (*conium maculatum*) has seldom been used as a poison, and is not likely to be taken by mistake; but the roots of the hemlock dropwort (*œnanthe crocata*) have frequently been eaten by mistake for parsnips, and the fool's-parsley (*æthusa cynapium*) has also been used for common garden parsley with a fatal result. They produce violent pains in the abdomen, with vomiting and obstinate purging of bloody mucus, convulsions, and death.

600. MONKSHOOD or WOLFSBANE (*aconitum napellus*) is sometimes mistaken for horse-radish, the root resembling that condiment. The taste is hot and acrid, and when swallowed, it is followed by a burning sensation in the throat, with pain in the abdomen, vomiting, and diarrhœa. These are soon succeeded by giddiness and delirium; and if the quantity taken is very large, coma and convulsions end the scene.

601. THE SEEDS OF THE LABURNUM are often swallowed by boys, with the object of playing truant from school; or they are given with a mischievous design to servants, &c. They produce vomiting and pain in the abdomen, followed by diarrhœa, and attended with slight giddiness and sometimes delirium.

602. THE POISONOUS MUSHROOMS have an astringent and styptic taste, very different from the true edible variety. Their effects are slightly irritant, but chiefly narcotic. The symptoms vary a good deal in different cases, even when the same dish has been partaken of by various individuals. Sickness and giddiness almost always come on; but occasionally there is severe pain in the stomach, while in other instances there is none felt, but only giddiness, headache, delirium, and faintness.

603. YEW BERRIES being of a bright red colour, and tempting in appearance to children, are sometimes swallowed by them. They produce slight vomiting and purging, but the chief effects are upon the brain, in the shape of insensibility, dilated pupils, coma, and convulsions, with cessation of the action of the heart, and death.

603*a*. HELLEBORE. Four species of this plant are met with in this country (green, white, black, and fœtid), of which the green is the most common, and the white the most virulent. All produce vomiting, purging, and convulsions, but, except in very young children, they seldom cause death. The black as well as the fœtid species are used as a vermifuge.

603*b*. ARUM. The plant so well known to children as "lords and ladies," or "cuckoo pint," is also a virulent poison, the symptoms being nearly the same as those from hellebore.

603*c*. MEZEREON (wood laurel). The red berries of this plant are often eaten by children, but not being strongly poisonous, serious injury seldom results. They are stimulant and diuretic in their effects, and having a slight tendency to produce nausea, they are often rejected by the stomach before absorption takes place.

BOOK III.

THE METHODS EMPLOYED IN THE REMOVAL OF DISEASE.

CHAP. I.—OBJECTS TO BE ACCOMPLISHED IN COMBATING DISEASE.

SECT. 1.—NATURE OF THE MACHINE WHICH IS TO BE REPAIRED.

604. Those who have carefully examined into the present state of our knowledge of the structure of the human body, in health as well as disease, must come to the conclusion that, though some considerable advance has been made within the last half century, yet, after all, we are in ignorance of much which ought to be known, in order to entitle either physiology or pathology to be called *a science*. The progress which has been made is about equal to that which miners have accomplished in boring towards the earth's centre. It is quite true that our mines are now sunk to depths which would have been flooded before the invention of steam; but still the formation of the centre of the earth is as little capable of proof as ever. In the same way the analytical skill of the chemist, and the powers of the microscope have enabled the physiologist of the nineteenth century to ascertain the exact shape of the globules of the blood, the proportion of clot to serum, and the amount of each kind of saline matter contained in it; but though it has been conjectured that this fluid is the seat of many diseases of different natures, yet no art has been able to ascertain by examining the blood, whether it was taken from a patient under typhus fever, or small-pox, erysipelas, rheumatism, or gout. In the same way, also, we are led to believe that the nerves are the seats of diseases called nervous; but no one, by examining a portion of their structure, would say whether or no it was, when alive, possessed of those diseased properties which we suppose to be developed under neuralgia. In combating disease, therefore, we must, above all things, remember that we are fighting an enemy of which we know little or nothing, and in a country of which our ignorance is almost as complete. It must suffice that we use all our cavalry forces to make their numbers and strength as clear as possible, and that we examine every map, however defective, which the hand of man has laid down on paper.

SECT. 2.—OUR REPAIRING TOOLS.

605. But not only are we ignorant of the exact nature of much that we have to contend against in the army of our enemy, but we are also almost as guiltless of a full acquaintance with our own army of drugs and other medical and surgical appliances. We call them all by their names, and we know some of their effects, supposing that at the same time we are aware of the nature of the enemy; but if we are deceived in that respect, we cannot tell what our own troops will do, and we often find that they serve us when we least expected it, and that on other occasions we are deserted by agents upon which we had placed almost implicit reliance.

SECT. 3.—TRUE AIMS OF MEDICINE.

606. MEDICINE is not therefore, now at all events, a true science fixed upon immutable laws, but it is "a conjectural act," in which *that man succeeds the best who makes the best guesses into the nature of the enemy's force*, and *who also has the best knowledge of his own.* Study and a good memory will serve him greatly; but they alone will never make a good physician, and unless there is the power added of weighing evidence and of judging of the relative value of cause and effect, all the hard work in the world will never do more than make an average "doctor."

607. The vast majority of mankind,

both in and out of the ranks of the profession, expect to be able in all cases to foretell the course of every disease according to a pre-conceived series of laws, and to meet each symptom by a corresponding antidote; and when disappointed, they complain of the defect in the principles on which they have hitherto treated disease, and fly off to some more boastful guide, till in turn all are exhausted. But those who complain of the uncertainty of orthodox medicine should make themselves sure that any other system is really capable of doing more, and should not merely be content with asserting that there must be a "correct principle" upon which medicine should be founded, and then in their blind search grasp at the shadow, because its substance is not perfectly satisfactory. The fact really is, that unless we know all the laws which regulate the human machine, we are not likely to be able to lay down principles which shall meet every case; and until we do know them, those are to be looked on with great suspicion who attempt to do so. The honest course lies in the confession of ignorance, and in the admission that, after all, our most scientific system of treatment is founded upon a series of recorded cases, in which certain symptoms have generally been successfully met by the adoption of a particular treatment. We may theorise and guess at something more, and we may call in the aid of *post mortem* examinations of diseased structure, to tell us whether we have been right or wrong in diagnosis; but at last our practice resolves itself into "experience;" and we are influenced either by what we have ourselves seen, or by what has been recorded by others as having been witnessed at the bed-side.

608. IT IS IN THE PREVENTION of disease that the greatest progress has been made of late years; and here we really may lay claim to considerable credit. Until the end of the first quarter of this century, little was ever heard of the necessity for drainage, cleanliness, and ventilation; but now these words are in every one's mouth; and though, perhaps, they may be made hobby-horses by some, yet there is no doubt that they have saved thousands of lives, especially among the crowded populations of our towns and cities. It may be said, that formerly there was little necessity for attending to these processes, as the towns were comparatively small; but those who are old enough cannot fail to remember the perpetual ravages of typhus fever, and the inroads made by ague on many constitutions—diseases which are now exceptional, and seldom met with in an epidemic form. Much yet remains to be done; but it was a great step taken when the public were convinced that disease and death follow in exact proportion to the non-efficiency of drainage, cleanliness, and ventilation.

SECT. 4.—VARIETY OF ROADS.

609. It may appear paradoxical, but it is no less true, that in medicine there are often several ways of effecting an object, and it is seldom correct to assert that because A will cure, the opposite to A will do absolute harm. Thus, in the case of many attacks of inflammation, hot and cold applications will do equally well, though their action is quite opposite. The former relax the vessels, and assist them in effecting one curative result of inflammation, viz., the pouring out of the serum into the cellular membrane; while, at the same time, they soothe the nerves and take off that poisonous effect upon the blood-vessels, which causes them to lose their tone. The latter, on the contrary, stimulate the vessels to a healthy action; and, as a consequence, they are, when effectual, much more rapid in their cure. A similar result attends upon the two opposite modes of treating various inflammations of mucous membranes, such as diarrhœa, which may be often relieved either by chalk or sulphuric acid; or bronchitis, which in some stages will yield either to stimulants like the balsams, or to a soothing and lowering medicine such as ipecacuanha when combined with opium. Sometimes, as in the above instances, we flatter ourselves that we know sufficient of the disease and of

the action of the remedies used, to understand the reason of these opposite roads both leading to the same end; but, after all, we only go skin-deep, and though we frame a number of words to express certain secondary phenomena, the primary ones are hidden from us, as we know no more how cold acts upon the nerves, or how ipecacuanha causes nausea or perspiration, than we know of the railroads in the moon, if there are any. All that we know of the above agents is, that cold stimulates the vessels to contract, and that ipecacuanha, while it irritates the vessels of the stomach, has a peculiar tendency to relax those of the skin and bronchial tubes; and upon that knowledge we act with confidence in many cases, founded upon these effects following in a large proportion of the experiments made.

SECT. 5.—RELATION OF EFFECT TO CAUSE.

610. One of the greatest difficulties in the healing art is the proper estimation of cause and effect. This is mainly owing to our defective knowledge of the machine, and to our ignorance of the ultimate laws which rule the animal economy. If we knew even as much of the human machine as the engineer does of the locomotive which he drives, we should be able to inspect it as he does, and should be almost always right in our prognosis, that it would perform certain duties for a limited time. But as we do not know anything like as much of the complex mechanism of which we are made, as he does of the engine he guides, we cannot always tell as he can, that when half a bushel of coal is put into the furnace, and it is stirred up, a certain volume of steam will be produced in a given time, which will enable his driving-wheels to accomplish a corresponding number of revolutions. On the contrary, we have always to consider well whether the steam produced is the result of the coal or of some other agent, for wo seldom are so situated as to be confined to one horn of a dilemma. It is only by collecting a series of effects, and ascertaining that all, or nearly all, were preceded by some particular circumstance likely to produce them, before it can safely be asserted that we have arrived at their cause. In medicine this can seldom be done, except in hospital practice; and for this reason it is that these institutions are so valuable. Thus in private, it often happens that credit is given to some inert substance, because, in one or two instances, its employment has been followed by an improvement in the symptoms of the disease for which it was given; but if this same remedy were adopted in a series of cases, such as may be found collected in a hospital, its uselessness would be detected, because, though one or two might improve, yet the whole number would not be affected by it. Here again, however, we are met by a serious disturbance in our calculations, arising not from the defect in the principles upon which these statistical observations are founded, but upon the liability to *preconceived bias* in the minds of those who record them. Every one who has endeavoured to trace the evidence of any particular fact must have been startled at finding that, what one person asserts to be black, another will describe as white, and yet both shall have been persons of average credibility—the reason being that the one looks with a black bias, and the other with a tendency to its opposite. Nothing in the whole range of what is called "science," is so suspicious as a newly propounded medical fact, except a medical case, which is a series of facts, and by so much the more doubtful as being a multiple of the former. The misfortune is that these facts and cases are almost always described by individuals who have some theory to support, and who, therefore, look at them through coloured spectacles, and describe them as they see them, perhaps, but nevertheless not really as they exist. Hence arise the contradictory results of observations, made not only by homœopathists, hydropathists, &c., but by many of the regular practitioners of orthodox medicine. Every one is naturally anxious to find for himself some sure and certain basis upon

which to ground his treatment of disease generally, and especially of that particular class or species which he is describing or examining. He begins by taking a certain account of it as correct in all its details, and expects that, if he follows the directions for treatment there given, he shall find it yield to his well intended and most painstaking efforts; but when he is disappointed, instead of humbly admitting, either that he has erred, or that the art he follows is necessarily defective, he fancies that he has discovered a more rational mode of cure; or if he has not self-confidence enough for that, he thinks that he has found what he seeks for in the writings of some other and more impudent *charlatan*, who presumes to assert that he can "effect wonders" by his "new process." Taking the truth of this for granted, and with an active imagination, he sets to work, and he treats two or three cases, or perhaps only one, magnifying its importance if it soon gets well, or denouncing it as *necessarily* fatal if it should turn out to be so. In either case, the symptoms are distorted to suit his conception of them, and if innocent, the new remedy gets the credit of doing what nature herself has effected, or if it is positively injurious, then poor nature is allowed to have her full share. In the medical profession this is constantly seen. Certain remedies are vaunted by the supposed discoverers of their great virtues, as wonderfully efficacious, and by a class of enthusiastic men, of active imaginations, they are *for a time* held up as "the modern," and therefore the best, remedies in those complaints for which they are proposed to be used; but these very men are generally the first to turn round and decry them, because as they expect much, so when they find little, they are the more disappointed, and very often reject a remedy which in itself contains some little element of good, because it does not come up to their standard of perfection.

611. With these acknowledged difficulties in the observation of cause and effect, even by those who make it the business of their lives, it is a perfect farce for the amateur observer of disease to attempt any dependence upon it in selecting his individual remedies. His only safe guide is to use his common sense in choosing what he believes to be the most trustworthy system of medicine, and follow that out, without attempting to judge for himself, excepting as to the application to practice of the directions which he finds given to him. If he goes beyond this he will find himself continually "at sea;" and he will be liable to fancy that, because a friend or relative suffering from some disease has not died under his treatment, he must necessarily have been the better for it. This mistake is not confined to the amateur; but it is more likely to be made by him than by the members of the medical profession, in proportion to the difference in the number of the cases which each have to treat, and the consequent greater difficulty in his case of detecting the relation of cause and effect. With this limitation to the scope of the domestic practitioner, it becomes desirable to investigate the claims which the various systems have upon the confidence of the public.

CHAP. II.

PRINCIPLES OF TREATMENT ADOPTED BY ORTHODOX PRACTITIONERS OF MEDICINE, SOMETIMES CALLED ALLOPATHISTS.

SECT. 1.—DEFINITION OF THE TERM ORTHODOX MEDICINE.

612. BY ORTHODOX MEDICINE is to be understood the curative art as expounded by legally-qualified physicians and surgeons of this and other countries. The system adopted is founded upon observations carried on for thousands of years, and handed down to us by writers on disease from the days of Æsculapius, Hippocrates, and Galen to the present time. Each succeeding age has had its prevalent theory, but it is astonishing how little the practice of its physicians was influenced by it. The humoral doctrine (first propounded by Hippocrates, and revived by our own Sydenham), which attributes nearly all diseases to changes in the blood, has kept its ground through all these changes, sometimes being nearly eclipsed, as by the mathematical dogmas of the seventeenth century, and the vital principle of Van Helmont. But it has been reserved for the nineteenth century to abandon all dependence upon anything but facts, and to accept only these when accumulated in masses from different sources. Theory is at the same time valued as explaining many things with some degree of probability; but it is not accepted as a firm ground upon which human life should be trusted; and when we consider the little improvement in our *practice* since the days of Sydenham, in spite of our increased knowledge of the anatomy, physiology, and pathology of the human body, we must own that his method of closely observing facts is after all the most valuable, although by many it may be called empirical. It has been attempted by Brown in the last century, and by others since his time, to make disease bend to some simple law which should explain all its phenomena, but hitherto without success; for neither his doctrine of excitability and exhaustion, nor the more recent one of "like cures like," will stand the test of careful observation. Without speculation, we are never likely to get at hidden truths; but the great rule in medicine is that of Sydenham, who is well called the English Hippocrates—that is, "Never to let any speculative opinions respecting the nature or cause of diseases interfere with their treatment." This sound authority in physic carefully observed the operation of remedies on the symptoms, and the effects of the various external agents to which the patient is exposed, and from these he deduced his indications; while, instead of accommodating his facts to his theories, as is now too often done, he always made his theory bend to his facts. His practice may perhaps in the present day be considered somewhat inert by the followers of Broussais in France, and Armstrong in this country, inasmuch as it consisted chiefly in attempts to meet symptoms as they arise, rather than to remove their cause; but the mode in which he carried out his views was always sound and judicious, and above all things, he took care *that if he could do no good, he would do no harm.* Those, therefore, who find fault with the heroic practice of physicians during the first quarter of the present century, must remember that the fault is not in the art which is taught by Sydenham, as well as by his more reckless successors, but in the men who make a bad selection of the means for carrying it out. His writings are still part of the standard medical literature of this country; and if they are referred to, it may be seen that he, at all events, is not obnoxious to the charges which are hurled against modern orthodox physic—of killing as many as it cures.

613. THE TERM ALLOPATHY is not properly used, except as a mode of distinction from homœopathy, and

even then is not founded on correct etymological principles. Orthodox physicians do not assert that diseases are in all cases to be cured by remedies which will produce the opposite condition to them. They gladly avail themselves of all the specific remedies which they can obtain; and they profess to cure disease by all means, of whatever kind they may be, which they find really have any power. The term can only be construed to mean the "curing disease by some means *different* from that which produced it;" and though this is sometimes done, yet it forms only a part of the modern practice of physic. It is, therefore, a misnomer, and should be abandoned by all those who wish to avoid the silly practice of "calling names." Even the homœopathists themselves admit that their principle, viz., "*similia similibus curantur*" was propounded by Hippocrates as *one* rule for the cure of disease, and ever since his time it has been acted on more or less. But it has also been supposed that in other cases "*contraria contrariis curantur*," and the two rules have divided between them the practice of medical men to this time. The words of Hippocrates are so remarkable, that they are quoted by some of the writers on homœopathy in support of their argument; and lest this fact should be doubted, I may extract from a pamphlet recently published by Dr. Sharpe the following sentence, "Homœopathy *is not a novelty*." He then goes on to adduce a Sanscrit authority for its antiquity; after which he inserts the following translation of a sentence from a work attributed to Hippocrates, which was known to Hahneman, and quoted by him:—"By similar things disease is produced, and by similar things administered to the sick, they are healed of their diseases. Thus, the same thing which will produce a strangury when it does not exist, will remove it when it does." And Hahneman likewise observes, that "later physicians have also felt and expressed the truth of the homœopathic method of cure." It is therefore plain from the showing of the homœopaths themselves, that orthodox practitioners are not strictly allopath, nor are they prevented from applying the chief principle of the homœopaths, as an occasional rule.

SECT. 2.—PRINCIPLES OF MODERN PHYSIC.

614. THE MODERN PRACTICE OF PHYSIC is founded upon two distinct principles—1st, the *rational system*, which endeavours, if possible, to ascertain the cause and nature of disease, and to relieve it by a remedy, or by a combination of remedies, the action of which is understood; 2nd, the *empirical method*, which contents itself with ascertaining that a disease is cured or benefited by an appropriate treatment, and is regardless both of the intimate nature of the disease and of the precise action of the remedy. Both of these systems are useful at times, and neither will serve in all cases, so that, though the rational system may be allowed to be the more scientific, yet it must not reject such a remedy as quinine, which undoubtedly cures ague, because its action cannot be explained on rational principles. Thousands of recorded cases have established its value, and tens of thousands of lives would be rendered miserable without its adoption in the wooded districts of recently settled countries; and therefore it is accepted with thankfulness as a specific cure on wholly empirical principles, even by the most ardent advocate of rationalism.

615. THE RATIONAL SYSTEM is liable to abuse when its advocates are always looking out for medicines which shall effect certain actions in the body, while as yet our knowledge is so imperfect as to fail in ascertaining their precise nature and essence. Thus they will not be satisfied with ascertaining the existence of the strengthening effect of bark, or the power of producing absorption possessed by mercury; and they refuse to use the former until they can assert that it imparts a healthy energy to the capillary arteries, and only adopt the latter when they have, as they think, shown that it has a peculiar effect upon certain vessels. But, after all, this is only concealing

ignorance by burying it a little deeper, for we are none the wiser or the better curers of disease, although we have arrived at these conclusions which may or may not be correct; and we might just as well satisfy ourselves by saying empirically, that bark acts specifically upon the body under ague, or mercury in enlarged glands, as to frame the long sentence which must otherwise supply the place of these words. Let it only be established that a peculiar effect is produced with a moderate degree of certainty, as far as the *cure* of disease is concerned; and we have done all that is needful, leaving the theory of its action to the calculations of those who prefer the shadow to the substance.

616. It may be urged that it is not desirable to throw cold water on the investigation of the hidden truths of nature, which may possibly hereafter reward the patient toil of some observer by discovering themselves to him; but I am not now writing for the instruction or advantage of those who are likely to attempt the task, and am only endeavouring to show to the amateur the limited extent of the knowledge which is possessed, even by those who have laboured hard in the investigation of disease, and the small probability which exists of the establishment by any human being of a system of medicine based upon any single law or simple principle of nature.

617. EMPIRICISM, on the other hand, is entirely devoid of theory and takes for its sole guide the fact, that certain remedies cure certain diseases, and if these were "known quantities," to use the language of mathematics, nothing more would be needful than to lay down specific rules for the cure of all diseases upon empirical principles. But practice tells us that no such known quantities exist, and that diseases vary in each succeeding year, so that what would be empirically right a twelvemonth before, would utterly fail at the time of trial. Hence it follows, that medicine cannot be entirely founded on experience, but must also be experimental to some extent, and to be so, it must call reason to its aid.

618. We may, therefore, come to the conclusion, that medicine should be founded partly on the rational system, and partly on the empirical mode of treating disease.

619. QUACKERY and EMPIRICISM are often confounded together; but the former means a very different state of things to the latter. By it is understood either the adoption of a *concealed* treatment, or the pretence that some one remedy is universal in its application. Most frequently the quack has recourse to both expedients, and parades some medicine whose ingredients are kept secret as a universal panacea for all the ills to which human nature is subject. Both of these plans are considered to be opposed to the interests of mankind, because it is well known that there *can* be no such *panacea*, and it is believed that the concealment is only intended for purposes of fraud. In some few instances, a process of manufacture of superior efficacy has been kept secret, as in the case of "James' powder;" and though this would come under the designation of a quack remedy, yet it is not liable to the same objection, inasmuch as its chemical composition is well known by analysis, though the precise method of manufacture cannot be reached.

620. It has recently been objected to the practice of orthodox physic, that it fills the system with poisonous drugs, by which it is ever afterwards injured; and a seceder from its ranks has even gone so far as to exhibit an engraving of *a furnace with irons heating*, as being part of the system which he has abandoned, and which he says "has been used for a long period." Now, although I have never seen this actual cautery used, I have, I am sorry to say, known drugs given to an abominable extent, and I am free to confess that in my life (present company, of course, excepted) I have seen quite as much harm as good done by orthodox medicine. But that does not make the *principle* one whit more untrue, although it may tend to prove some error in the state of *practice*. Great numbers of men within the ranks of the profession have written against the practice of

"drugging" on all occasions, and gradually it has become more rare to meet with such horrid examples as were often exhibited in former days. Indeed, so well is the fact known, that Dr. Billing, in his first principles of medicine, concludes with the following caution, which should be carefully treasured by every young practitioner, whether professional or amateur :—"I have only to add that, in applying remedies, though not a moment should ever be lost, we must have patience in allowing them to act; and that, though inert practice is mischievous, the safety of the patient depends upon *ne quid nimis*."—which, for the benefit of my female readers, I may translate as "not doing too much." Many other writers on the practice of medicine have been still more strong in their denunciations of the abuse of drugs; but the above extract has been inserted as, in my belief, the happy mean between the two extremes.

621. FOR THE PROPER TREATMENT OF DISEASE, it is not only necessary that we should possess a clear knowledge of the causes, nature, and symptoms of disease, but we must also investigate the action of those medicines which are to be used in their removal. This subject has been comparatively neglected; and it must be confessed that we know very little more of the *modus operandi* of medicines than was known a century ago. There is great difficulty in the investigation, owing to the variety and complexity of the proofs required to establish any point with absolute certainty. It has been truly observed by Glassford in his *Principles of Evidence*, that "in reasoning as to the probable effects of particular remedies on the human body, the conditions and circumstances of the latter are so various in different cases, and the number of concomitants which have to be considered, in addition to the more obvious facts and symptoms, is so great, that the utmost exertion of human sagacity, founded upon the largest induction of particulars which any one mind is capable of embracing and retaining, can do no more than approximate to that real evidence of which the case seems by its proper nature to be susceptible." In this, as in most other matters, the more we know the more we discover the extent of our ignorance of things beyond our knowledge. Nothing has led so much to the continuance of ignorance and to erroneous practice as the dogmatical treatment of matters which we do not comprehend; and when we are, as is often the case, quite in the dark as to the operation of a medicine, we should quietly admit our ignorance, and patiently wait for its removal.

622. ON NO QUESTION, perhaps, have scientific men differed more than on the theory of the action of medicines. Sometimes incompatible facts have been adduced by each party to an argument, and at others, the same fact has been made the basis for two or more widely different interpretations. The most recent, and I believe the most correct, theory of the action of medicines is that propounded by Dr. Headland, in an essay to which the Medical Society of London awarded the Fothirgillian Gold Medal in 1852. In this essay the author lays down the following propositions, which he afterwards proceeds to prove, "as if each were a theorem in geometry, sometimes dividing it first into a number of minor propositions, which taken together imply the original one, and which have to be separately dismissed." But as the arguments adduced *pro* and *con* would take up nearly the whole of this volume, and as they would not be very interesting to many of my readers, I must refer those who wish for further proof to Dr. Headland's essay for a full satisfaction on these points—merely introducing here what I think may be desirable for the information of the general reader.

623. BESIDES A HOST OF MISTY AND VAGUE GUESSES at the actions of medicine, there have been three attempts made to explain their *modus operandi*—1st, on *mechanical principles*; 2nd, on *chemical principles*; and 3rd, on *vital principles*.

624. THE MECHANICAL THEORY of the action of medicine was very general in the two last centuries, aris-

ing probably from the great stride which had then recently been made in the study of physics. Thus, it was supposed that each absorbing surface was made up of a series of holes of various shapes and diameters, and that in like manner articles of food and medicines were constituted of fragments or molecules of various shapes; as a consequence of which, those of the latter which were fitted *by shape* to pass through certain holes, were taken up by them and conducted in one direction with a corresponding effect, while other and differently shaped molecules passed through other foramina, and had their own particular location and results. These hypotheses, however, were not founded on any experiments, and ultimately gave way before the progress of animal chemistry and physiology, which disproved many of its assumptions, and consequently threw a doubt on the whole.

625. THE CHEMICAL THEORY was first broached by Galen, though in a very crude form, he confining his belief to certain changes produced by heat and moisture only. After him came the alchemists with their visions of the *elixir vitæ* and the philosopher's stone, and their belief that all medicines acted by virtue of the proportion of *salt*, *mercury*, and *sulphur*, contained in them. Next came the believers in the *acid* or *alkaline* reaction of all remedies, and with this was generally coupled the production of *fermentation* by them. And lastly, when chemistry became exalted into the position which it now holds, many of its students came to the conclusion that all the changes produced by medicines on the system, are the result of decompositions and recompositions in the various elements contained within the body, uniting with those of the remedies used.

626. BY THE VITAL PRINCIPLE is meant one which is confined to living bodies, and the actions concerned in which do not take effect elsewhere. We are, however, wholly unable to explain the precise mode in which life acts; and, after all, we can merely select this principle as the only tenable ground, inasmuch as we can clearly disprove both the mechanical and chemical theories, and have no other choice left. Various theories have been propounded by which it is attempted to make this vital principle more clear, as the following list will show, embracing as it does all, or nearly all, of those which have been broached. Thus, it has been conjectured that the general operation of remedies in the cure of diseases may be effected—1st, by *degrees of stimulation;* 2nd, by *counter-stimulation;* 3rd, by *opposition;* 4th, by *similar agencies;* 5th, by *elimination;* 6th, by *alterative action;* 7th, by *various counter-actions.*

(*a*) *The theory of cure by degrees of stimulation* was promulgated by Dr. J. Brown, in the latter part of the last century; but as many remedies differ not only in degree, but also absolutely in quality, it cannot be maintained.

(*b*) *Counter-stimulation* differs from the theory of Dr. Brown in supposing two contrary agencies, instead of a variation in degree only. Thus all medicines were classed as stimulants and counter-stimulants, or sedatives, which were each to be used in a certain class of diseases.

(*c*) *The last-mentioned theory supposes* only two general conditions of disease, and is therefore found to be deficient, inasmuch as there are clearly more than these in existence. To supply this defect a more plausible hypothesis has been invented, consisting in the theory that each particular disease or symptom is to be cured by administering a remedy, which is capable of producing a contrary state (*contraria contrariis*). On this principle purgatives are given in constipation, opium in diarrhœa, sudorifics when the skin is too dry, and diuretics when the kidneys are deficient in their action. This theory, however, is defective, inasmuch as it does not include many aids which are now considered most valuable, and which act chiefly by evacuation and revulsion.

(*d*) *The cure by an agent similar to the disease* (*similia similibus*) is exactly the reverse of the last method, and is the foundation of the rule proposed by

Hahneman. It will be presently seen that the cure, when it is effected by a substance apparently like the disease, is really dependent upon an article whose effects are similar to the efforts made by nature to get rid of the disease, and which are often very prominent symptoms, though not really constituting the essence of the disease.

(e) *The theory of elimination* is very old, having been propounded by Hippocrates, and most probably by antecedent writers among the Hindoos. Sydenham was, however, the first who brought forward this method of curing disease, by assisting nature in eliminating a diseased material from the system; and he maintained the propriety of letting her do her work as long as she seemed capable of effecting it without aid, believing that "all disease is nothing more than a vigorous effort of nature to throw off the morbific matter, and thus recover the patient." This theory, in the main, appears to be correct; and it is generally adopted in the present day, but with sundry modifications and additions which cannot be considered to be connected with elimination.

(f) *An alterative* or *revulsive action* is supposed to depend upon a new effect being produced, which diverts the attention of the system from the original disease; the former term being applied to a general effect upon the whole system, while the latter is applied to local action, such as external counter-irritation, or purgation, or vomiting. But although the facts upon which the theory is founded are well-known and indisputable, yet the explanation of them is a mere form of words, expressive of the fact; for we cannot really fathom the ultimate action going on in the case of alterative medicines, nor do we know how revulsives effect the reduction of disease by counter-irritation. The eliminative action of both must not be forgotten, when it exists as in the case of copious watery evacuations in purgation, and of those discharges of serum which accompany some forms of counter-irritation.

(g) This, which is the *generally received modern theory*, embraces the whole of the preceding theories, as far as they are believed to be true. Thus a disease of the blood is to be met by agents which will counteract it in the blood-vessels themselves. A relaxation of muscular fibre is to be treated by tonics or astringents, and a diminished secretion, by such remedies as will tend to act on the secreting organs; but as no single theory will explain all these processes, so it is needless to attempt one, and the only phrase which expresses the whole, is to be found in that which corresponds with this paragraph—namely, that medicines are useful in the cure of diseases *in operating by various counteractions.*

SECT. 3.—DR. HEADLAND'S PROPOSITIONS.

627. PROP. 1.—*That the great majority of medicines must obtain entry into the blood or internal fluids of the body before their action can be manifested.* This is now generally admitted, and has been proved by innumerable experiments.

628. PROP. 2.—*That the great majority of medicines are capable of solution in the gastric or intestinal secretions, and pass without material change, by a process of absorption, through the coats of the stomach and intestines to enter the capillaries of the portal system of veins.* By the aid of the gastric juice, &c., there is little or no doubt of the truth of this proposition; and even in the case of those medicines (stomachics), which give tone to the stomach itself, there is reason to believe that they are partially absorbed. Some, however, such as demulcents, seem to act solely on the mucous membrane itself; but these are so few as scarcely to deserve much notice; nevertheless, they are certainly exceptions. It is also doubtful whether many purgative drugs are absorbed or not, though it is clear that their action when introduced into the veins is the same as when swallowed.

629. PROP. 3.—*That those medicines which are completely insoluble in water, and in the gastric and intestinal juices, cannot gain entrance into the circulation.* This is true in the main, but there are apparently some few exceptions.

630. PROP. 4.—*That some few remedial agents act locally on the mucous surface, either before absorption or without being absorbed at all. They are chiefly as follows:*—(a) *irritant emetics;* (b) *stomachic anæsthetics;* (c) *irritant cathartics.* This includes all those emetics and cathartics which would not act as such if injected into the blood, but cause vomiting from the local irritation which they produce. Thus, common salt, mustard, and horse-radish may be used to produce vomiting; but no quantity introduced into the system by absorption would act in a similar way, while ipecacuanha or tartar emetic will establish their emetic influence if introduced into the blood-vessels just as well as if swallowed. So, also, castor or croton oil will have the same purgative effect, whether swallowed or absorbed from the skin, or injected into the veins; while gamboge, metallic mercury, tin powder, &c., act solely by the local irritation they establish.

631. PROP. 5.—*That the medicine when in the blood must permeate the mass of the circulation, so far as may be required, to reach the parts on which it tends to act; that there are two possible exceptions to this rule*—(a) *the production of sensation or pain at a distant point;* (b) *the production of muscular contraction at a distant point.*

632. PROP. 6.—*That while in the blood the medicine may undergo changes, which in some cases may, in other cases, may not affect its influence. That these changes may be* (a) *of combination,* (b) *of reconstruction,* (c) *of decomposition.* As an example of this, free oxygen, as contained in the blood, is constantly being united with organic substances introduced into it. So, also, it is believed "that the alkaline salts with vegetable acids are changed in the blood into alkaline carbonates."

633. PROP. 7.—*That a first class of medicines, called* HŒMATICS, *act while in the blood, which they influence; that their action is permanent; that of these, some called* RESTORATIVES, *act, by supplying, or causing to be supplied, a material wanting, and remain in the blood; that others, called* CATALYTICS, *act so as to counteract a morbid material or process, and must pass out of the body.* Thus, supposing that a medicine has entered the blood, it can act in one or other of two methods. In the first it absolutely and permanently changes the blood itself; as for instance, the salts of iron, and the class called tonics, whilst in the second the blood is only used as a vehicle to convey it to some gland or other organ of the body, as in the case of nerve medicines and astringents, and of the eliminant medicines, particularly mercury and iodine. It is the first of these processes which is described under the 7th proposition.

634. PROP. 8.—*That a second class of medicines, called* NEUROTICS, *act by passing from the blood to the nerves, or nerve-centres, which they influence. That of these, some called* STIMULANTS, *act so as to exalt nervous force in general, or in particular. That others, called* NARCOTICS, *act so as first to exalt nervous force, and then to depress it; and have also a special influence on the intellectual part of the brain. That others again, called* SEDATIVES, *act so as to depress nervous force in general, or in particular.* The action of these medicines (neurotics), instead of being gradual and slow, as in the case of hæmatics, is rapid, but soon over. They do not effect any change in the blood, but soon pass out of it. It is at present impossible to describe the exact method of their acting; and all that can be done is to watch and note down their effects. Thus no one can explain the reason why opium in large doses contracts the pupil, while either it in small doses, or belladonna in any dose, enlarges it. So with sundry other peculiar effects of sedatives and narcotics, we cannot fathom the special reason for each; but, nevertheless, we can take note of them, and use them, perhaps quite as well as if we knew all the remote changes which they produce.

635. PROP. 9.—*That a third class of medicines called* ASTRINGENTS, *act by passing from the blood to muscular fibre, which they excite to contraction.* These medicines appear to act either by con-

tracting the muscular coats of the blood-vessels and diminishing secretion or hemorrhage, or by contracting those of the ducts of the glands, and thus diminishing the various secretions by impeding their flow.

636. PROP. 10.—*That a fourth class of medicines called* ELIMINATIVES, *act by passing out of the blood through the glands, which they excite to the performance of their functions.* This class includes all those which increase the secretions and excretions of the body. Their action may be explained by analogy, although beyond this there is no direct proof, further than that the fact is as here described. For instance, it appears that each gland has a tendency to extract from the blood those materials only which are its special office to select, and which together combine to form its own peculiar secretion. In the same way, it appears that all medicines which are thus passed from the blood have a tendency to be selected by some gland or glands in preference to others; and thus it happens that some act on the liver, others on the kidneys, and so on.

SECT. 4.—CLASSIFICATION OF REMEDIES.

637. By the above 10 propositions, Dr. Headland attempts to account for the action of all medicines on the human body, and to include every one of them under the several heads therein mentioned, namely:—

1. HŒMATICS.
   - (1) Restoratives.
   - (2) Catalytics.
2. NEUROTICS.
   - (1) Stimulants.
   - (2) Narcotics.
   - (3) Sedatives.
3. ASTRINGENTS.
4. ELIMINANTS.

SUB-SECT. A.—RESTORATIVES.

638. THIS VARIETY OF MEDICINAL SUBSTANCES is so named, because they are all supposed to restore to the blood some material which is deficient in it, in consequence of disease. They are all absorbed into that fluid, and their effect is not transient, so that they may remain in it for an indefinite time. They consist of—1st, *alimentary substances;* 2nd, *acids;* 3rd, *alkalies;* 4th, *tonics;* 5th, *chalybeates;* 6th, *solvents.*

(*a*) *Aliments* can only be considered as remedies under particular states of the system, in which it has either been deprived of a proper quantity or quality of food, or is in such a feeble condition as to require those kinds most easily digested. It is therefore in the form of what is called "diet" that they here come under consideration, and more particularly in the two diseases *diabetes mellitus* and *phthisis*—in the former of which it is desirable to avoid all substances from which sugar can be formed, and in the latter to exhibit a material which shall combine a very large proportion of carbon and hydrogen in a small bulk, as is found in cod-liver oil.

(*b*) *Acids* are either *mineral* or *vegetable.* The former consist of the *sulphuric*, *hydrochloric*, *nitric*, and *phosphoric* acids, while the latter comprise the *acetic*, *citric*, *tartaric*, and *malic* acids. These free acids may either correct an alkaline condition in the blood, or remove a phosphatic deposit in the urine, or assist a weak stomach by affording a substitute for the acids required by digestion, and thus set free a further supply of them for that purpose.

(*c*) *Alkalines* are required when acid is in excess in the blood, as in gout, rheumatism, and dyspepsia.

(*d*) *Tonics* derive their power from a bitter alkaloid principle, which in every case is absorbed into the system. Their mode of action is not very easily understood, and they are described by some authors as stimulants. They include cinchona, quassia, casparin, gentian, calumba, chiretta, rhubarb, hop, chamomile, and cascarilla, besides the active principles called quinine, cinchonine, and salicine. Some of them, as cinchona, quinine, and salicine, have a remarkable effect in curing ague.

(*e*) *Chalybeates* include the various combinations of iron with oxygen and the mineral and vegetable acids, including also the natural chalybeate waters. Most of the salts of iron are soluble in water, and those that are not so are no doubt dissolved by the aid of the gastric-juice. They are all capable of being absorbed into the blood, and have been detected in it by analysis. Iron is essential to the production of one of the elements of blood (hœmatosin), and whether or not it is contained in that material, there can be no question that, without the presence of iron, hœmatosin cannot be developed or continue to exist, and so we find both deficient in anœmia, for which iron is a specific.

(f) Solvents are those medicines which render the salts of the urine soluble in the water which suspends them. They consist of the mineral alkalies, their carbonate and neutral salts, with vegetable acids; also biborate and phosphate of soda, benzoic acid, the mineral and vegetable acids.

SUB-SECT. B.—CATALYTICS.

639. The word CATALYTIC means *destructive*, and it is applied to these substances because they are supposed to destroy or counteract certain diseased conditions of the system, passing out of the body afterwards. Catalytics are divided into various orders, according to the precise diseases which they are to counteract—as *antiphlogistics*, when intended to remove fever and inflammation; *antiscorbutics*, when scurvy is to be driven out, and so on.

SUB-SECT. C.—STIMULANTS.

640. THESE ARE EITHER GENERAL OR SPECIFIC—the former comprehending all those remedies which are usually called stimulants, such as ammonia, musk, castor, &c.; while the latter includes those that exert a peculiar stimulus on certain organs, as strychnia on the muscular nerves, &c. The following list comprises most of the stimulants in common use:—

General Stimulants.—Ammonia and its carbonates; phosphorus; musk; cloves and nutmegs; cinnamon and cassia; rue; valerian; ginger, mustard, and pepper; onions and horse-radish; pimento; cardamom; juniper and turpentine; serpentary; cascarilla; capsicum; guaicum; myrrh; balsam of copaiba; balsam of Peru and Tolu; assafœtida and galbanum; ammoniacum; benzoin and storax; pine resin.

Special Stimulants.—Strychnine and nux vomica; ergot of rye; borax and rue.

SUB-SECT. D.—NARCOTICS.

641. NARCOTICS act on the nervous system by first exalting and then depressing it. They have also a special effect on the intellectual manifestations of the brain. They may be said to comprise—1st, *those which more especially produce drunkenness*; 2nd, *those that cause sleep*; and, 3rd, *those which are followed by delirium.*

642. THE INEBRIATING NARCOTICS are alcohol (in all its various forms, and as wine), the æthers, chloroform, camphor, Indian hemp, tobacco, and lobelia.

643. THE SOPORIFICS produce sleep. They comprise opium, lettuce, and hops, as well as hemlock and hyoscyamus in some degree, but these act more especially as sedatives and deliriants.

644. THE DELIRIANTS are hyoscyamus, belladonna, stramonium, and conium. They relieve pain, but have little other tendency to produce sleep.

SUB-SECT. E.—SEDATIVES.

645. SEDATIVES are medicines which directly repress nervous force, some by acting on the nerves in general, others by confining their influence to particular nerves—the two kinds being called *general* and *special sedatives.*

646. GENERAL SEDATIVES include hydrocyanic acid, creasote, aconite, colchicum, conium, tea, and coffee.

647. THE SPECIAL SEDATIVES are antimony, ipecacuanha, and digitalis.

SUB-SECT. F.—ASTRINGENTS.

648. The action of the astringents has been already sufficiently described at par. 635. They consist of the mineral and vegetable kinds.

649. MINERAL ASTRINGENTS include the mineral acids, acetate of lead, sulphate and sesquichloride of iron, alum, the sulphates of zinc and copper, bichloride of mercury, and nitrate of silver.

650. THE VEGETABLE ASTRINGENTS

are tannic and gallic acids, oak galls, kino, catechue, log-wood, rose-leaves, uva ursi, tormentil, and creasote.

SUB-SECT. G.—ELIMINATIVES.

651. ELIMINANTS have been already described as promoting secretions from the special glands upon which each kind acts. They are divided into—1st, *sialogogues*, or those which act on the salivary glands; 2nd, *expectorants*, or those which promote the bronchial secretions; 3rd, *cathartics*, those which purge; 4th, *cholagogues*, those which specially act on the liver; 5th, *diaphoretics*, acting on the skin; and, 6th, *diuretics*, which act on the kidneys.

652. SIALOGOGUES include several irritant substances among them, though these act on the salivary glands solely because they happen to be near the mucous membrane of the mouth, and not because they have any special action on these glands. Such are ginger, pillitory of Spain, and betel-nut; but mercury, and, in some cases, iodine, act specifically on these organs, so as to produce a true salivation.

653. EXPECTORANTS include chiefly antimony, ipecacuanha, squill, the various balsams, turpentine, camphor, and most of the volatile oils.

654. CATHARTICS embrace a long list, which may be divided into mercurials, resinous, acrid and oily matters, and salines. Mercurials acting on the liver as well as on the bowels, are specially required where the bile is defective in quantity, but they are generally combined with other purgatives. Resinous cathartics include jalap, which is a mild drug, and suits children where the stomach is not inclined to reject it. Scammony, colocynth, and camboge are more drastic. Of the oils, olive oil is barely purgative, being merely laxative, from its oily nature. Castor oil is very safe and useful in all cases of trifling constipation. Croton oil is a dangerous cathartic. Among the acrid principles, rhubarb, aloes, and senna are the most generally useful, the last being somewhat too irritant, and inclined to gripe; while aloes, from acting specially on the rectum and colon, is unfit to be used in piles or in pregnancy. Hellebore is a very powerful acrid substance, and is seldom used in modern days. Elaterium is still more so, and is only used when, in cases of dropsy, a very powerful effect is to be produced. The salines in small doses pass off by the kidneys; but when their quantity is too great for that purpose the bowels are irritated, and their vessels discharge an enormous quantity of watery fluid, which washes them away.

655. CHOLAGOGUES are medicines which act specially on the liver, and are, therefore, of great importance in the treatment of the diseases of that organ, which have been shown to be very common. They include mercury, which is far the most powerful of all, and which is the only one which can be proved to be actually carried off by the liver. Also ipecacuanha, rhubarb, and podophyllin, which act chiefly by stimulating the duodenum; and lastly, dandelion, which appears to have a decided effect upon the liver, but in what way is not decidedly ascertained.

656. DIAPHORETICS include a variety of substances—as salines and diluents, under certain conditions; volatile substances, such as ammonia, volatile oils and alcohol; certain acrid matters, as guaicum; some of the narcotics, as opium and camphor, especially when combined with ipecacuanha and antimony; and lastly, antimony, mercury, and sulphur.

657. DIURETICS may be classed under four groups—1st, diluents, as water, either pure or containing soluble mineral substances; 2nd, acrid matters of various kinds, such as cantharides, juniper, turpentine, copaiba, horse-radish, &c.; 3rd, alcoholic and ætherial stimulants; 4th, those minerals which increase all secretions, such as mercury, antimony, and iodine.

CHAP. III.

HOMŒOPATHY.

SECT. 1.—WHAT DOES HOMŒOPATHY CLAIM TO BE?

658. HOMŒOPATHY professes to be a new system of curing diseases, by following what it is asserted are three general laws of nature, namely—1st, that *like cures like;* 2nd, that *the healing properties of remedies increase* by *subdivision*, *trituration*, and *succussion;* and, 3rd, that as a consequence, *infinitesimal doses are the proper ones* to be adopted in treating disease. These three laws were propounded by Hahneman, a German physician, and first published to the world as the foundation of the homœopathic treatment of disease in 1796. They have been studied and adopted by a considerable number of educated men, both in and out of the medical profession; and as there is certainly no secresy in the mode of practice, it is not obnoxious to the charge of "quackery."

659. AT PRESENT IN THIS COUNTRY the system is said by most of its defenders to rely solely upon the first of the above three laws, and as far as the etymology of the word homœopathy is concerned, they are right in the ground they have taken; but there can be no doubt in the mind of any candid person who examines the question, that the three are inseparably mixed up, and that the existence of the system must depend upon the truth or falsehood of the whole. Hahneman certainly considered it to be so; and he laid quite as much stress upon the second as upon the first of the laws adduced above. This is not denied by any of his defenders, or by any of the advocates of the new school; but it is alleged, nevertheless, that homœopathy may stand, even if infinitesimal doses should be found to be inert. Now, as I am not here attempting to run a tilt against the homœopaths, but simply endeavouring to ascertain if there is anything in their system which entitles it to be received as a better guide than that previously established throughout the civilised world, I shall merely investigate the truth of each of their laws, in as few words as possible, leaving my readers to draw their own conclusions.

660. DR SHARPE, A CONVERTED ALLOPATH, about twenty years ago, wrote a series of pamphlets, ostensibly with the intention of convincing his brethren of the profession which he has abandoned, but really I should imagine from their style, framed for the purpose of including a larger shoal of fishes. In his first pamphlet, entitled "What is Homœopathy?" he begins by asserting what it is *not*, namely, "1st, that it is no novelty; 2nd, that it is not quackery; 3rd, it is not globulism; 4th, it is not an uncertainty; 5th, it is not an infinitesmal dose; 6th, it is not humbug." He then goes on to say what it is, as—"7th, homœopathy is a general fact, a principle, a law of nature; 8th, it is a practical fact; 9th, it stands upon its comparative merits; 10th, the old method is unsatisfactory; 11th, homœopathy is simple and intelligible; 12th, it gains by comparison with the old system; 13th, it is medical treatment; 14th, it is a practical guide; 15th, it is a guide in the choice of the medicine, not of the dose; 16th, it aims at eradicating or permanently curing the disease; 17th, it economises the vital powers; 18th, it is gentle and agreeable; 19th, it administers one medicine at a time; 20th, the homœopathic physician learns the properties of drugs by experiments upon himself, not upon his patients; 21st, homœopathy is applicable to acute as well as to chronic diseases; 22nd, it is prepared for any new form of disease far better than the old method; 23rd, it carries into detail what all medicine is in the general; and 24th, *it relates only to the administration of remedies, and detracts nothing from the value of the collateral branches of the science of medicine.*"

Here, then, is the modern confession of homœopathic faith, and certainly rather a comprehensive one, inasmuch as it may include almost every practitioner of the healing art without much straining of his organ of credulity. He has only to admit that an occasional fact is a ground for a general law, and his subscription may at once be taken, for beyond this there is nothing whatever in the creed. By the second rule, it is not globulism, and by the fifth, it is not an infinitesimal dose; and when the whole is carefully analysed, it resolves itself into the one law, that "like cures like." If this be true, it is no doubt all that Dr. Sharpe maintains in his seventh and following propositions; for of its *applicability* to *practice*, *simplicity*, and *agreeability*, no one can entertain the slightest doubt, supposing only, as above remarked, that it is founded on the laws of nature. Certainly without the globulism and the infinitesimal dose, it would not be so *agreeable;* but as medicines are nauseous in proportion to the extent of their dose, so a small one, even if ponderable, is less disagreeable than another of greater weight.

661. In conjunction with the above propositions, it must, however, be remembered that homœopathy is propounded by its advocates, not as a system which may be adopted by any orthodox practitioner of medicine and united with his ordinary guides, but as a new creed opposed to all previous theory and practice, and entitled to far higher respect than its predecessors, by reason of its greater curative powers, of its doing less harm, and of its superior agreeability in practice. According to Dr. Sharpe, "it is the medicine of mercy; it proposes to emancipate the suffering invalid from every disagreeable, harsh, and cruel proceeding to which he has been so long exposed; it professes to be able to cure more quickly, safely, and pleasantly than is possible by any other means; it promises to the physician himself the satisfaction of a scientific method, in place of vague experiments." In the same page, he says, "homœopathy is true; and I now include in that word the principle *(similia similibus)*, the moderately small dose, and also the infinitesimal dose." So that, after all, his followers are required to accept the infinitesimal dose, in spite of his fifth proposition, which makes exactly the opposite declaration. But as Dr. Sharpe is not the organ of the homœopaths, but only one of the most recent and well-educated writers on the subject, it is needless to attempt to expose his contradictions. It will, I imagine, be granted by most people that his last admission is in accordance with the general practice and belief of his fellow-converts; and I quite agree with him, that it is not necessary to accept all Hahneman's speculations and hypotheses, which he brought forward to explain the *modus operandi* of the principles which he enunciated. Truly, no sensible and educated man can hope to be believed when he says, he can understand them, and certainly, as Dr. Sharpe maintains, by rejecting them, "homœopathy is placed upon a foundation which it has not yet fairly occupied." In his twelfth tract, he asserts, "it is a fact supported by sufficient (?) evidence, and to assail it as such will be found a task much more difficult than to criticise speculations, however ingenious. The question is thus greatly simplified, and reduced to one alternative—either the thing is true, or the testimony is false. To settle this point, both reasoning and assertion are alike impertinent. The testimony has a claim to be received, the thing is true according to the evidence, *until* facts, the result of trials as least as numerous, on the testimony of witnesses at least of equal ability and integrity, are brought forward to support the opposite probability."

SECT. 2.—EVIDENCE FOR AND AGAINST HOMŒOPATHY.

662. Although practically homœopathy is made up of the three principles mentioned at par. 658, yet it may be convenient to examine into the evidence for each of these by itself.

663. FIRSTLY, IT ASSERTS, AS AN INVARIABLE RULE, that "like cures like,"

and that, as a consequence, when a disease is to be cured, it is necessary to seek for the remedy in some article which will produce a set of symptoms similar to (but not the same as) those of the disease. It is admitted by the opponents of Hahneman, that occasionally like will cure like, but not so frequently as to render the rule useful, much less absolute, and upon this question issue must be joined. In favour of the universality of the rule, we have the evidence or opinion of Hahnemau himself, confessedly so bad an authority that most of his followers throw him over as such, and look upon him only as a gifted man, without ballast enough to keep him right. In addition to him, at a fair computation, may be adduced about one per cent. of the medical profession in Europe, or perhaps considerably less, and among them only a very few of the leading men in each country. Against it are arrayed ninety-nine per cent. of the profession, including the leading men in it, almost without exception. But it may be said that they are prejudiced against the law. Why so? It is confessedly no new proposition of any individual out of the pale of the profession, and therefore injurious to its pride; but it is an old theory, first brought forward by Hippocrates, a name honoured by all, and since his time revived by several others of high rank, *but by all as a partial rule only, and not as a general law.* Hahneman also was an educated physician, so that on every ground the theory had the advantage of good parentage, and would be accepted, *if true*, without difficulty. But it was, and is, rejected by 99 to 1, and as far as medical evidence goes, it is, therefore, to be considered as a false guide if intended to be universal. Nevertheless, since it is accepted as a partial truth, it may be and is, acted on to a considerable extent, by the orthodox practitioner; and he may always be allowed to decide for himself without inconsistency, whether or no he shall adopt the principle in any particular case.

664. It cannot be alleged with any fairness that the regular practitioner of medicine is unable to decide this question on account of his ignorance of it, because it is admitted that it is an old theory, formerly confined to particular cases, but now carried out to the extent of a general law. Neither can it be denied that he still adopts the practice in part, so that he is quite as capable of exercising his judgment on the subject as Hahneman himself. If, therefore, this is the case, and if he has no selfish motive to prevent him from coming to an impartial conclusion, and if still he decides against homœopathy in the proportion of 99 to 1, it appears to me that the balance of medical testimony is so strong as to be overwhelming.

665. But granting that the above difficulty as to testimony can be got over with regard to this grand rule, it is next desirable to ascertain what grounds there are for the assertion so confidently made by Hahneman that his peculiar mode of preparing medical drugs has any advantage in the exhibition of remedies. He advises all substances to be either dissolved in alcohol, with the addition of *succussion*, and then a drop or two of this solution re-dissolved in more alcohol, repeating the process each time up to the thirtieth dilution; or that an analogous mode of sub-division should be carried out by means of *trituration* with sugar of milk, the sub-divisions being in the same proportion. These succussions and triturations are supposed to "potentize" the substance—that is to say, to give it greater power than before, so that an infinitesimal dose obtains an efficiency in this way, which it cannot reasonably be supposed to possess without it. Here, then, is a marvellous power asserted to be developed in a most simple manner, and, what is most remarkable, by a process which is constantly adopted in the ordinary dispensary or druggist's shop, without any such effect. At first it appears incredible that any increase of power should arise from such a trivial cause; but nevertheless we are told that "*it is the fact.*" Then "let us see it proved," say the sceptics; "let us take fifty

phials containing fifty medicinal solutions of the thirtieth potency; let a drop from a given number of phials, each of which latter is marked with a sign or number, indicating the particular medicine, be administered by a third party to a given number of persons. Each medicinal substance produces its own specific effects, and as these effects are very considerable, there can be no difficulty in recognising them. Let any homœopathic practitioner note down the effects as they occur, and if he can identify the fifty phials by the effects produced by their contents—if he can tell us correctly in such a case No. 1 was given, in such No. 4, and so on, then we will acknowledge homœopathy to be true, and not what we now declare it, an imposture and delusion." This offer, it must be remembered, was made publicly by Dr. Bushnan at the time when he held the responsible office of editor of the *Medical Times;* but it was never accepted, and very naturally it was asserted and believed that it was not, because the feat is an impossible one. I have myself privately offered to test the matter on a smaller scale, and with much less difficulty in the way of the homœopath, but with no more success than Dr. Bushnan. Now, I do honestly believe the method to be a very fair one, though carried rather to extremes when fifty phials of the thirtieth dilution are to be the means to be used; but, on the discovery of the contents of, we will say, a dozen phials of even the fourth or fifth dilution, I should be quite content to ground my own adhesion to the infinitesimal dose, which, however, does not necessitate the acceptance of the first proposition, that "like cures like." No one will deny that a small dose, if even equally useful, is better than a large one in point of economy, as well as the absence of the disagreeable taste which most medicines are endowed with. If, therefore, they can be used in the doses advocated by the homœopaths, a great advantage would be gained in every point of view. With this opinion I felt bound, as well as anxious, to ascertain for myself whether the second and third dilutions would produce any effects at all; but I have tried them on myself separately, without being able to discover the slightest result. For many years I was a martyr to the dyspepsia, headache, and other disagreeable attendants on constipation, and I would at one time have travelled barefoot for many miles to obtain a globular remedy for it. Without faith in its virtues certainly, but still with a good will, I tried nux vomica, pulsatilla, bryonia, and opium, in the third dilution, which last I was assured *must* produce the desired result, as my case was so obstinate in consequence of the long continued use of drugs, and opium was the proper remedy for that complication. Alas! I might as well have taken nothing, although I carried the experiment so far as to take five or six globules for a dose, and finished by emptying half a dozen bottles. This certainly prevented my gaining any faith in the remedies for this particular disease, and nothing which I have since seen has altered my opinion. I have tried at various times more than half of the various kinds of medicine which are sold in the globular form; but I never could perceive the slightest effect on myself, nor have I, by close watching, ever witnessed any perceptible symptoms produced in others. Imagination will do wonders, and its operations may readily be mistaken for those of the globule. A lady once put herself into the train in great distress, and came straight to me to tell me that she had been poisoned at Cheltenham by an overdose of homœpathic medicine, which had produced certain remarkable symptoms. Her medicine was contained in a bottle, marked with the superscription of a well known druggist there; and, to calm her, I immediately poured out double her dose and swallowed it. She eagerly watched me for some time, and finding I was not affected by it, she became less alarmed, and at last, after I had gone some miles, and returned alive and well, she consented to try it again to satisfy me. But this second dose was as harmless as the first had been injurious, and she lost faith in homœopathy from that day, though perhaps with as little ground for her want of confidence as she had previously for her implicit reliance on it.

666. THE HOMŒOPATH'S EVIDENCE, therefore, in favour of the efficacy and potentiality of his infinitesimal doses is met by a fair offer of putting them to experimental proof, which has never been accepted. These doses have also been tried again and again by competent medical witnesses, and found wanting, and especially by the celebrated French physician, Andral, who tried them most fully and carefully without any effect. I have tried them on myself—I have seen them tried on others—without any result, as far as I could judge. The evidence of ninety-nine to one in the profession is against their possessing any power at all. And, lastly, this evidence is unprejudiced, *because it is the interest of the medical practitioner to make medicine as pleasant as possible*, and to accept the smaller dose, if only it is efficacious. It may, therefore, be asserted that, after an investigation extending over fifty years, the homœopathic dose is decided to be inert by at least ninety-nine out of every hundred medical practitioners.

667. But are the virtues of this extraordinary dose capable of any other method of proof? The homœopaths say—"Yes! Conjoined with the whole of our system, it may be tested by statistical data, founded upon the result of treatment in public and private, as compared with that of the old or allopathic establishments." Now there can be no doubt, that if this comparison is in favour of homœopathy, and that there is no possibility of collusion or deception, the power of the dose is proved; because, supposing the doctrines of homœopathy to be true, and that they are carried out in practice, by the adoption of the infinitesimal dose, this last must have the virtues attributed to it, if *by its means* an unusual success can be attained. But I believe fully that the trial never has been made fairly, either in this country or abroad, and indeed it is a very difficult matter to carry it out. Assertions are made on all hands that typhus fever and cholera have been less fatal under homœopathic treatment than under that of the regular practitioner of medicine; but the mortality in these diseases is now generally admitted to be increased by any vigorous attempts at treating them with drugs of any kind; and therefore the experiment, however successful, is no proof of the virtue of the infinitesimal dose, although it may tell against the old system of drugging. The only fair way of trying the power of this method of treatment is to select such cases as are known to be easily affected by treatment of some kind, and which yet have no tendency to a natural cure. Of this nature are many skin diseases; and these have also the additional advantage of being capable of constant inspection, and their progress towards a cure regularly watched. They are also of a chronic character, and their continuance for a somewhat longer period would not endanger life. Now, if tho homœopathist will only cure a few well-marked cases of chronic eczema, or porrigo, or psoriasis *by genuine homœopathic treatment properly carried out*, there can certainly be no doubt of the power of his remedies, and it will then be time enough to compare their efficacy with the larger dose. But I am afraid, if we wait till then, our patience will be exhausted. It may be observed, that I have expressly stipulated that the cases shall be well marked, and here would be the only liability to error, since the selection must almost necessarily be in the hands of a partizan. I have already enlarged, at par. 620, on the difficulty of arriving at truth in regard to medical facts, where a preconceived theory is to be supported or negatived; and for this reason I look with the greatest suspicion upon any collection of cases brought together for the express purpose of proving any system of treatment. The selection is sure to be in the hands of a partisan, who will either collect a number of slight attacks of the disease to be treated, in which case the result is necessarily favourable, or he will reject all but those which are already doomed, and then the event

may easily be foretold. Thus the celebrated returns from the Vienna hospital, which are so much vaunted by the homœopath, are not fair samples of their general treatment, for the reason that this hospital had the most unusual advantages of being outside the city, on a peculiarly healthy spot, and commanded every possible accommodation which money could procure. Besides these, the cases *were carefully selected* by a number of ardent disciples of the treatment, which was exclusively adopted, and who, as a matter of course, were not unprejudiced in favour of homœopathy, because they had already given in their adhesion to it. If the assertions of converts are to be taken unreservedly, we should be obliged to believe in the universal efficacy of Morison's pills and Holloway's ointment, which are said to do even more than Hahneman and his followers. But the experience of mankind compels us to be exceedingly careful in admitting the accuracy of any series of cases, however carefully drawn up, the compilers of *which have any specific object in view.* It is only where they have been recorded in large numbers by indefatigable students of disease, without any other object than the general study of the whole subject, that they are really valuable; and it is from such data only that true grounds for generalisation can safely be drawn.

668. THE MISFORTUNE IS, that the cool dispassionate enquirer stands aloof, leaving to the disputatious the task of combating the arguments adduced by the advocates of any new process or remedy. The consequence of this may readily be imagined to be, that ridicule is thrown upon what should be met with fair proof or disproof, and thus very often a weak cause is converted into a strong one, in the opinion of those who consider every person ridiculed as a martyr. But these sensitive people must not fancy that there are likely to be any Galileos in the present day; truth may have some difficulty in struggling to the surface; but there is no instance in this century of its taking many years to do so, and yet, *homœopathy is now eighty years old!* having been published to the world in 1796. The homœopath argues with some degree of plausibility, that he has been refused a fair trial in this country, because he has not been allowed to try the powers of his system in the wards of our English hospitals. Now, this certainly would be a hardship in the case of any other art but that of medicine; but here human life is at stake, and those who have the management of our public hospitals would undoubtedly be guilty of a breach of trust, if they allowed the lives under their care to be tampered with. They therefore say, "show us some reasonable proof that you can do what you say, and then we will consider your request: you come before us with a story utterly incredible according to our judgment, and yet you ask us to place human lives in your hands to be risked, and, as we at present believe, suffered to slip through your fingers." This is a perfectly correct proceeding, and no one can possibly blame them for thus acting; and if no further proof can be adduced, the offer must still be refused. They say in defence of this refusal, "we assert that your globules are inert. This surely can be readily proved, since you discover their virtues by experiments on healthy persons. Then, first prove their powers in that way, after which we may perhaps be induced to allow you to try on our helpless charge." Surely this is the proper method, and what any dispassionate individual would do under the circumstances, yet it has been made the foundation of a charge of martyrdom, and instead of being made to redound to the credit of the governors of our hospitals, it has been adduced as a proof of bigotry and illiberality. But in spite of doubts and difficulties, it has fairly been put to the test in some public hospitals, and especially in Paris by M. Andral, who decided against its possessing any powers whatever, and who is admitted, even by Dr. Sharpe himself, to be a person deserving of his "high regard." But even his decision is impugned by them, as being the result of a trial

ignorantly and disingenuously made, and this is said of one of the most scientific men in the world, and certainly of one as little liable to the charge of ignorance as any one in Europe. On the other hand, a single instance has occurred of the conversion to homœopathy of a man in authority, in the case of Dr. Henderson of Edinburgh, who has expressed himself satisfied with the evidence offered in its favour, and his opinion must be taken at its proper value, to balance that of the hundreds who adopt the contrary view.

669. BUT IS HOMŒOPATHY A SYSTEM WHICH IS CAPABLE OF BEING INVESTIGATED BY THE PUBLIC with a chance of a correct decision? It appears to me that this question must be answered in the negative; and for that reason I have not, and shall not, enter upon a discussion here of the various subtle arguments which bear upon it. Its acceptance or rejection out of the profession should rest upon the evidence afforded by common sense, looking through the glasses of those men who have studied the subject. Supposing a jury assembled to try an action in which any peculiar art or science is deeply concerned, such as the cause of a railway accident, the falling of a house, or any other similar matter, what course do they take? Why, they hear the evidence of those who ought to know more of the question at issue than themselves, and upon that evidence they act, balancing the conflicting statements, if there are any, and coming to the best conclusions they can upon it. Just so is the case as between the public and any system of medicine which is offered to their notice. They cannot possibly be as good judges of its value as if they had devoted their lives to the consideration of medical subjects, and so all men of ordinary judgment use their common sense to look at it through the opinions given of it by those who know better than themselves. But if it could be shown that those who are to be supposed to be the best judges are prejudiced or interested parties, it might certainly be said that it is better to use what power of judgment is possessed than to depend upon those who refuse to use theirs fairly and in an impartial manner. This would be a good ground for throwing over the overpowering decision of the profession, *if it existed;* but that it does not must be clear to every one who examines into the matter, as I have already shown at pars. 663 and 664. At the same time, I fully admit that the medical authorities of this country *now* throw all their weight in opposition to homœopathy, because after the trial of it for half a century, they believe that its principles are incomplete, and that its practice is a *nonentity.* They are, therefore, compelled to announce to that part of the world which trusts them, that homœopathy is not a reliable system of medicine. Thus, the College of Physicians have declared through their president, that it "regards the so-called homœopathists as neither skilful nor safe." The court of examiners of the Apothecaries' Company "still refuses to admit any person who calls himself a homœopathist;" and the various medical colleges throughout Great Britain have expressed themselves in nearly similar terms. It may, therefore, be taken as an admitted fact, that the judgment of the profession, and especially of its constituted authorities, is against homœopathy. But if Hahneman had not been satisfied with the constitution of the jury, and with the probable impartiality of his professional brethren, why did he appeal to them in the first instance? Because he knew that they only were correct judges of such a question, and because he believed that he could convince them. I do not for one moment consider him an impostor, for all his proceedings and the tone of his writings have raised him much above that level; but that he was an enthusiast, and that his active imagination carried him far into the realms of fanciful delusions, I have not the slightest doubt. Nothing but monomania can explain his absurd invention of *itch* as the ground-work of half the diseases to which the human frame is subject, without the shadow of

proof adduced, and in the face of every probability. But having had the good sense to select his jury properly, he should have abided by their decision; and if his doctrines had been founded in truth, he would in due time have been welcomed as a grand discoverer of a simple general law, with the additional credit of finding out a pleasant and harmless mode of administering the appropriate remedy. Yet we are told—"if, then, there be folly in bringing this matter before the public, the folly rests with the old school, not with the new; it is plain that homœopathists have no alternative; the affair is already before the public; it has been carried there by their opponents; they are compelled, however reluctantly, to plead the cause of homœopathy before this tribunal."—*Dr. Sharpe.* Yes, if it is to exist, it must be by the sufferance of the public, because it is rejected by the profession; but surely this is a most strange argument for an educated man to offer, and is only to be equalled by the assertion made by almost all homœopaths, that the authorities and the profession, generally, are ignorant of the whole question upon which they so strongly offer an opinion prejudicial to homœopathy. Yet, at the same time, these gentlemen well know that every physician is or ought to be conversant with the principle upon which the new system is founded, and has constant opportunities of verifying its partial, but not universal, truth.

SECT. 3. — CONCLUSIONS ON THE NATURE OF HOMŒOPATHY AS AT PRESENT PRACTISED.

670. MOST OF THE MODERN HOMŒOPATHS having given up Hahneman as their guide, it is not fair to judge of their modern theory by examining his published writings. This prudential proceeding has, as Dr. Sharpe remarks, materially improved their position, when considered in a defensive sense, because it prevents those telling attacks which used to be directed against Hahneman's absurdities, blasphemies, and obscenities, and which had some considerable effect upon the educated classes, as well as upon all people of decent morals. But as I am quite ready to admit that homœopathy may be true, although many of Hahneman's theories and conclusions may be false, I see no impropriety in his followers giving up what parts of his system they think wrong; and I should be sorry to saddle them with a particle of the absurdity and dirt which they have discarded. With regard to Hahneman himself, it appears clear to me that he was an enthusiast, who could not be contented without attempting to carry out Sydenham's opinion, "that there must be some fixed, definite, and consummate mode of healing;" and in order to effect his purpose, he eagerly seized upon a theory which he found ready to his hand in the writings of the old physicians, and tried to carry this out as a general law. But though he would find it succeed in some cases, he would fail in more, unless he used such small doses as to be utterly inert, and then his active imagination taking the place of reality, he might revel in any number of successes which his mind should create for him. Every one who knows anything of medicine must be well aware that large doses of ipecacuanha will not relieve vomiting, although, on the principle of *similia similibus*, it is the appropriate remedy. Here then was at once a difficulty, and to get over it Hahneman's inventive mind propounded the doctrine of the infinitesimal dose, and carried it down to the point of dilution, in which ipecacuanha might be administered without danger of keeping up the mischief. Then came the absurdity of the idea that the one hundred-thousandth part of a grain of ipecacuanha should have any effect at all; and to meet this again, the theory of "potentiality" came to his aid. But not content with these curious inventions, he also met other, and not less serious, objections by the itch hypothesis, which is now, I believe, generally abandoned, though I do not know how its place is supplied. His *Organon* is full of eccentric ideas, which show him to be a man of great originality, but with such an exceeding want of ballast that he is not a safe

guide, even in matters of ordinary experiment, so that his followers are obliged to repeat all the series upon which he professes to have grounded his whole system.

671. BUT IT IS SAID THAT HOMŒOPATHY is now adopted and believed, and its theory and practice prescribed by educated men in all countries, whose imaginations are not over-active, and whose judgment is sound. It may be so, but unfortunately I have never met with such, either in person or through their writings; and I am compelled to come to the conclusion, either that they are deficient in judgment, or that they adopt homœopathy as a trade which may serve their purpose. I cannot avoid this conclusion when I find men like Dr. Henderson and Dr. Sharpe abandoning the ranks of the regular profession for those of the homœopaths, and yet holding out that there is no connection between homœopathy and the infinitesimal dose. Why, without this said dose, the system could not survive a week, since it might be proved by experiment to be without foundation. Hundreds of cases might be adduced, in which the exhibition of a drug producing "*similar*" effects would increase the disease tenfold, and would thereby disprove their set rule. At the same time, they find many acute cases which must be treated with the full dose, or they would end in death in a few hours; and in them they do not scruple to use that dose, as I know from actual experience. Thus, they blow hot and cold to suit each particular circumstance; and, while they accept Hahneman's theories when they suit them, they discard all that can be readily disproved, for fear of being considered to be defeated. They will neither accept the infinitesimal dose, nor will they discard it. They do not like to admit the necessity for the ordinary dose, because then they declare the weakness of their system; and so, while they avoid the open and honest, though mistaken, hypotheses of Hahneman, they are induced to practise deceptions which nothing can justify. I have been told by the advocates of homœopathy, that it cannot signify how disease is cured so that it is cured. This is true as regards the disease, but not as regards the physician, who, if he deliberately stoops to pretend to do something, while he knows he is doing nothing, will be guilty of a gross fraud, and is unworthy of all credit. With these opinions I should, therefore, come to the conclusion, that those who merely believe in the general, but not invariable, application of the rule "*similia similibus*," can apply it within the ranks of the profession, as many do; but, if they go farther and carry it out to the full extent of homœopathy, they must adopt the doctrine of the infinitesimal dose, or they must come to the conclusion that ipecacuanha in the ordinary dose will cure vomiting, and senna will at once put a stop to diarrhœa, that opium will relieve apoplexy, and digitalis be useful in fainting. Accept the infinitesimal dose, and test it by experiment, as propounded at par. 665, when, if it is unsuccessful, the whole crumbles into dust, and the system is exploded; or if, on the other hand, it is found that there is any virtue in these doses, the profession will be ready to test their value, but not till then.

672. YET, while I thus maintain that the homœopath is placed between the horns of a dilemma, I am ready to admit that the practice of the system has done good service to the world. In the first place, it has been proved that many acute diseases recover under what we believe to be no treatment at all; and it has been shown that drugs are not so essential in all cases to the cure of disease, as had been previously maintained by those who were interested in their sale and employment. Partly from the anxiety of medical men to do something which would afford relief, partly from the same feeling in the patient and his friends, and partly from its suiting the pocket of the former, an enormous amount of drugs has been dispensed and swallowed, and, I believe, to the great injury of the health of this nation in particular. This error is now fully recognised in the profession,

or at all events among the leading members of it; and it is gradually becoming the general belief that the unnecessary exhibition of a single dose of medicine is a most reprehensible act. But granting the practical errors of ordinary medicine, homœopathy is not made thereby more true; and it must still be accepted or rejected by all sensible men, as in itself either true or false.

673. I believe, therefore, that homœopathy is necessarily made up of two parts—one theoretical, and as old as Hippocrates, that "like cures like"—the other practical, and the invention of Hahneman's brain, that medicines should be used in infinitesimal doses, being rendered more potent by division, succussion, and trituration. I believe further that its professors, in order to escape the charge of inconsistency, must adhere to these two rules; and, if they wish to avoid the imputation of deceit, they must discontinue that dabbling in ponderable doses, which marks their disbelief in the theory which they profess to uphold. Complete consistency is not to be expected in human nature; but we have a right to demand that those who put themselves forward as the advocates of a system superior to all others, shall be able to stand such tests as would ordinarily be required in the common concerns of this life.

674. But, lastly, it must be carefully remembered that the present theory of homœopathy does not dispense with the necessary study of disease, which has been carried to a great extent by the orthodox pathologist, to whom the homœopath still leaves the task of ascertaining the nature and cause of disease, while he claims the merit of selecting the proper remedy, and in the most eligible dose.

CHAP. IV.

HYDROPATHY, OR THE WATER CURE.

SECT. 1.—NATURE OF HYDROPATHY.

675. HYDROPATHY comes before the public with the same tale which is told by the homœopath—viz., that it is rejected by the heads of the medical profession; and such no doubt is the fact, but for a very different reason. The former system, it has been shown, is not received, because it is believed to be inert; but the "water cure" incurs censure, inasmuch as its advocates maintain that it is a universal panacea, or very nearly so, and that it is wholly a new system invented by Preistuitz; while, on the other hand, those who deny it are of opinion that it is an old and well-known remedy, useful in many cases, but incapable of being made use of with advantage to the extent which the disciples of Preistnitz hold out as its proper scope.

676. HYDROPATHY is said to act in three different modes; and from my own experience and observation, I believe the assertion is founded on fact. These are—1st, *the actual reduction of temperature by the application of cold water;* 2nd, *the healthy stimulus to the nerves, by which they are braced and rendered capable of resisting the changes of temperature incidental to all climates, but especially to the English;* and, 3rd, *the production of a critical eruption by which various poisons (whether the result of disease, or consisting of drugs swallowed for its removal), may be removed from the system.* But though I believe that hydropathy may truly be thus described, I am as fully satisfied that its professors have too often made it a handle for quackery and fraud; and while they have pretended that it is capable of

curing almost every form of disease, they have also alleged that it has done, and can do, what is beyond its powers. Thus, I have known it asserted that, after a long course of mercury, globules of quicksilver have been extracted by the water-compress, and they have been produced before the astonished eyes of the poor patient. Now, I do not deny that mercury has been abused; but, nevertheless, even if in the particular cases to which I allude, it had been used to a most dangerous extent, it is a fraud to practise on the nerves and credulity of the poor patient by pretending to do what never has been done, and what, though it may be possible, is, in our present state of knowledge, wholly beyond the powers of man. Still, as in ordinary medicine, the abuse of an article should not prevent our adopting it within its proper sphere of utility; and, therefore, if it can be shewn, as I believe it can, that the use of the hydropathic processes is attended with beneficial results, we ought to employ them wherever we can.

677. But the hydropathists affirm. and I believe with great truth, that most of their processes are not only useless, but they are absolutely injurious, if not united with careful dieting and with bodily exercise in wholesome, and if possible, mountainous air. They therefore recommend the adoption of the "water cure" in certain situations only, where there are combined—1st, a hilly district, free from luxuriant vegetation, and suited to strong exercise in a bracing air; 2nd, a full supply of pure water, which should, therefore, if possible, be from a granitic range of hills; and 3rd, such an arrangement as will ensure a wholesome diet, which can best be controlled when it is completely under the superintendence of the physician. Now, it cannot be denied that these several conditions are dictated by common sense, as well as by the ordinary rules of the healing art, for we all know that these adjuncts are of great importance in the cure of disease, and if useful in general, they must be useful in the particular instance of the "water cure." It is not, therefore, correct to complain of the "water doctor" taking advantage of them; but at all times it is a subject for fair discussion, how far his cures are dependent upon the accessory exercise, air, and diet, and what share the water has in producing them. That many good cures have been effected, I have not the slightest doubt; but I am certainly not prepared to distribute the exact amount of credit to each of the four candidates for it. I can, however, testify that I have tried all of the water-cure processes without the aid of any extraordinary accessories, and with less advantage than I expected to derive from them, and than, I fully believe, would have been derived with the usual accompaniments. Consequently, as far as my experience goes, these aids must form a part of the treatment, if it is to be of its full use. The professors of the water cure in this country are not fond of explaining their modes of practice, or of throwing open their houses for the inspection of the medical profession; and although I have had a strong desire to watch the progress of their treatment, I have never yet been able to accomplish my wish. On one or two occasions, I have even been denied the privilege of seeing a patient whom I have myself recommended to adopt the water cure, and though I have certainly been treated with civility, and with invitations to the dinner-table of the "water doctor," which I did not want, I have never been able to break through the *cordon* which is maintained round their establishments, as far as the profession is concerned. I am aware that this might be owing to a fear of unfair treatment, which has certainly been adopted on many occasions; and therefore I do not bring this forward as a proof of illiberality, but only as accounting for my own inability to arrive at an exact knowledge of the nature of the water cure, as practised in the establishments exclusively devoted to its use.

SECT. 2.—PROCESSES USED IN THE WATER CURE.

678. The following are the usual

directions given, *in England*, for the various baths, compresses, packings, &c. With regard to the temperature of the water, it is considered of great importance, and no doubt very properly so. The baths, as in ordinary practice, are called cold, tepid, warm, and hot, the actual number of degrees upon Fahrenheit's thermometer being, however, generally designated in each case. In the majority of cases, it will range between 50° and 60° F., but in many instances it will be increased to 70° F., and cases are by no means uncommon where it should be raised to 80° F. Beyond this temperature, the utility of baths is very limited. Use and the particular state of the body will materially affect the impression produced by each of these several temperatures; and thus, water at 65° F. will feel cold to one person, warm to another, and tepid to a third. Hence, if it is desired to give a tepid bath to each of these individuals, it must be raised above 65° F. for the first, while it will just suit the third, and be somewhat too high for the second.

679. In the "water cure," it is a common practice to transfer the patient from water at one temperature to a bath at another; and it is also a frequent method to prescribe for a patient a warm shallow-bath to sit or lie in, while cold water is poured over the upper part of the body. The transition is generally made from the warm to the cold bath, as is practised by the Russians, and not, as was formerly the ordinary custom among the Romans, either from the cold bath (*frigidarium*) to the hot bath (*calidarium*), or *vice versâ*.

680. A SHEET is always used in drying the body, in preference to towels—in the use of which latter a portion of the body is exposed to evaporation, which is supposed to be chilling and injurious.

681. EXERCISE is also enjoined both before and after most of the baths.

682. THE COMPRESS is a piece of coarse linen wetted and applied to the skin, and covered again with dry cloths. It is removed several times a day, wetted, and re-applied. There are several situations where it is ordinarily used:—

(*a*) The *Gräefenburg Heating Compress* consists of a piece of coarse linen, 8½ feet long and 8 or 9 inches broad, furnished at one end with two tape strings. Before putting it on, it is rolled up, beginning at the tape end; then a portion of it sufficient to go once round the body is to be wetted and well wrung out, after which it is wrapped round the abdomen, the dry portion coming last and covering the other, and the whole being fastened by tying the tapes. It is worn all day, and sometimes at night also, and wetted at the time of taking the usual baths.

(*b*) The *Chest Compress* is made also of coarse linen, in the shape of a breast-plate, and of a size to cover the whole front of the chest. It is fastened by tapes round the neck, arms, and waist. This is wetted, wrung out, and applied; and then another, rather larger, and made of double linen, is fixed over it in a dry condition.

(*c*) The *Malvern Compress* is on the same principle as the above, but in addition, a piece of oiled silk or Macintosh material is interposed between the layers of the dry outer cloth.

(*d*) The *Wet Cap* is a compress made to fit the head, and used in the same way.

(*e*) *Other Compresses* are adapted in shape to any part of the body which may require their use.

683. FRICTION WITH WET TOWELS is variously applied.

(*a*) The *Upstanding Rubbing Sheet* is adopted in the following manner:—The patient stands in a shallow bath perfectly naked. A sheet of convenient size is then dipped in cold water, and as much of it is wrung out as will prevent its dripping from the lower edge. It is then thrown over the patient, including his head, and invests him completely, reaching to his ankles. With the loose portions of the sheet the patient rubs himself actively in front, while the attendant, standing behind, uses strong friction on the outside of the sheet with his hands, rubbing it as it clings to the body, and not, as is sometimes described, using the sheet to scrub the body with beneath. This friction is continued for two or three minutes, when the sheet is removed, and a dry one is thrown over the body, which is then rubbed perfectly dry, and the effect of all is a delightful and healthy glow.

(*b*) The *Recumbent Rubbing Sheet* is applied when the patient is too weak to stand. The patient is invested with a wet sheet as he lies on a blanket covering a mattress, and is then rubbed by the attendant as described at (*a*).

(*c*) The *Under-blanket Wet Friction.* All the coverings are removed from the bed, except a single blanket on the mattress upon which the patient is placed, and is then covered by a second. The bath-man now dips a towel in cold water, wrings it out, and wraps it about his own hand. With this the body of the patient while under the blanket is well rubbed, the towel being again and again dipped in water according to the orders of the physician.

(*d*) *Wet Rubbing Towels* are applied as follows:—The patient stands up in an empty tub or bath, beside which is a pail of cold water with two coarse towels soaking in it. The bath-man, standing behind the patient, lifts one of the towels full of water and lays it gently on his head, when it is immediately seized by the patient, who uses it to rub himself rapidly with it, on the face, and all the front of the body, arms, and legs. As soon as he has gone once rapidly over the whole, he hands the towel to the bath-man, who saturates it with water again, and replaces it on the head as before, the patient going again through the same series of rubbings. During the time while he is doing this, the bath-man is occupied in rubbing the whole of the back, including the back part of the arms and legs, and each towel is wetted three times, the whole bath being said to consist of the "wet rubbing towel of three towels."

(*e*) In *Wet Friction* the patient stands up undressed, and receives from the bath-man a towel which has been dipped in water, and then wrung out as dry as possible. With this he rubs himself all over the front of the body, while the bath-man does the same behind with another towel, the whole process occupying two or three minutes, and the patient being afterwards wrapped in a dry sheet, and thoroughly dried.

(*f*) *Wet Spinal Friction* is applied like the last, but to the spine only, the towel being used for a greater or less period of time, and with the temperature and quantity of water ordered by the physician.

684. THE SHOWER-BATH is used in hydropathy exactly as in the ordinary mode, which is too well known to need discription.

685. THE SHALLOW-BATH is merely a tub or metal bath, sufficiently wide and long for a person to sit down with extended legs. Water is poured into this to the depth of four inches, and in this the patient sits down, and immediately begins to rub himself all over in front, either with his wet hand or with a towel dipped in the water. Every now and then he throws a handful of water over his head, which is also to be rubbed. In the meantime an attendant should be employed in rubbing the back and ribs from behind. This bath should last from one to ten minutes, according to the judgment of the physician, and on coming out of it a large dry sheet is immediately thrown over the patient as he stands up, covering him like a cloak, and being used to dry him as rapidly as possible. He immediately dresses, and takes the prescribed walk.

(*a*) In the *Head Shallow-bath*, a person lying on his back places the back of his head in a conveniently shaped pan, containing water to the depth of an inch or two. After a short time, the head is turned to the right and then to the left, so as to immerse as much as possible of the back of the head in the water.

(*b*) The *Sitz-bath* is a shallow bath, adapted to the hips only. It is used in the bath expressly made for the purpose, resembling the ordinary hip-bath, or in a common tub, if nothing else is to be had. Water is poured in about four inches deep, and in this the patient sits for five, ten, fifteen, or twenty minutes, according to his directions. Usually a blanket is thrown over the upper part of the body, and the patient is generally enjoined to rub his abdomen vigorously during the whole time.

(c) In the *Running Sitz-bath* fresh water is admitted at one aperture, while at another of corresponding size a similar quantity is constantly running off, thus keeping it at the proper height, and maintaining the exact temperature of the whole bulk of water from which the bath is supplied.

(d) In the *Fountain Sitz-bath*, the patient sits upon a sort of stool with a central aperture, through which rises a jet of water, which flows off from an opening in the bath below.

(e) *Hand, Elbow, Arm, Foot, and Leg Shallow Baths* are also supplied to the several parts which are here specified.

(f) In the *Eye and Ear Shallow-bath*, a kind of cup is made to fit the eye or ear, and being filled with water, it is applied to the eye or ear for one, two, or three minutes.

686. THE SPLASH-BATH consists in the shallow-bath, with a small stool placed in it, upon which the patient sits, and is well splashed with the water by the attendant.

687. THE FULL-BATH is one in which the water is deep enough to come up to the patient's waist, instead of being only four inches deep.

688. THE PLUNGE-BATH is deep enough to allow of full immersion; and when used, the patient only remains in one, two, or three minutes, according to his orders.

689. THE DOUCHE is a column of water, which descends through a pipe about two or three inches in diameter from a cistern fixed above the patient, at a height varying from twelve to twenty feet. The patient, while the stream is descending, places himself close beside it, and looks steadily at it; then he extends his right arm under it, and allows the water to flow over it for a second or two; next, the back of the neck is brought under its influence, and then the left arm. The patient must then bend his head backward, and allow the water to strike obliquely on the chest, and retreating a little, and thrusting out the abdomen, this comes next in for its share of the stream. When this is over, the head is suddenly bent forward, and the douche is received on the back of the neck and down the back itself; and after extending the legs to allow them to receive a portion of the water on their backs and sides, the body is held erect under the douche, protecting the head from its play by the hands held over it as a shield. The whole operation is completed in about two or three minutes, and to those whose health and strength are suited to it, is a most delightful and invigorating process, far different from the terrible account which is often given of it by those who have only a theoretical knowledge of its effects. It is, however, not suited to delicate or enfeebled constitutions, and all require considerable preparation by the use of water, &c., before they are capable of taking the douche with advantage and safety.

(a) The *Can or Pail Douche* is applied to the patient as he sits in a tub or bath without water in it. A certain number of pails of water are dashed against him, part of each being thrown from before, and the rest from behind, and the number varying with the order of the physician. The patient then comes out and is dried in the sheet as usual.

(b) For the *Head Douche* the patient removes from the neck every restraint, and if a lady, throws forward her hair over the head in the shape of a long rope; a blanket is thrown over the shoulders, and brought closely round the neck; the patient then kneels down and holds the head well forward over a shallow bath, tub, or pan, while an attendant pours over it one, two, or three cans of water. After this the patient has the hair rubbed, without using very strong friction, and then it is adjusted, a walk being generally taken at once, and if the hair is very profuse, it is better to let it hang down unbound in the open air until quite dry.

(c) For an *Eye Douche*, a syphon apparatus or a syringe is generally used.

(*d*) *Local Douches* may be applied to any part of the body at discretion.

690. The WET SHEET PACKING is the chief novelty in the "water cure," and is considered by its advocates to be its crown and glory. It is said to equal blood-letting in its power of reducing inflammation, and yet not to be followed by the debility which attends the use of the lancet. Its advocates maintain that it has the soothing power of opium, combined with the tonic properties of quinine, and the absorbent virtues of iodine. Without doubt it is a powerful agent, and in some cases of great value, as I can testify; but, like all such remedies, it is capable of abuse, and I have certainly seen some very narrow escapes from death following its use; while in one or two instances, I fully believe it has actually produced that result. Nevertheless, carefully used, I believe it to be a most valuable remedial agent, and that Prestnitz will hereafter obtain the credit which all such inventive geniuses deserve. The mode of application is as follows:—Remove from any ordinary bed every covering but the mattress, upon which a pillow is to be placed for the patient's head; then spread a couple of blankets over the mattress, and partly over the pillow, and upon them a sheet which has been dipped in cold water, and then wrung out as dry as it can be made by the strength of two persons. Upon this sheet the patient is to lie down totally undressed, with the head on the pillow, when the sheet is immediately folded tightly round the body, and over it the blankets, so as completely to envelop the arms with the body. Several other blankets are then heaped upon the patient, and tucked well in on each side, so that he lies completely encased, and unable to move hand or foot, the head only being visible. Sometimes a small feather-bed must be added, if the heat-generating power in the body is at a low ebb. A small towel or handkerchief is usually tucked under the chin, to keep the blanket from irritating the skin of the face, and in this condition the patient is allowed to lie for a time, varying from a quarter of an hour to two or three hours, according to circumstances, small quantities of water being generally supplied to him by the attendant at intervals. At the expiration of the time specified, he is taken out of the packing, and immediately submitted to one or other of the various forms known as the shallow-bath, rubbing-sheet, wet rubbing-towels, and pail douche; after which he is dried with the dry sheet, and then either sent out to his walk, or put into an ordinary bed.

(*a*) The *Half-Wet Sheet Packing* is managed like the above, except that the wet sheet only extends as high as the arm-pits and down to the knees, while the arms are excluded from it, and only enveloped by the blankets.

(*b*) In the *Front and Back Towel Packing* the patient is enveloped in the blankets as before, but with a wet towel of the usual size placed under him, and another over his body.

691. THE BLANKET PACKING is performed exactly like the wet sheet packing, except that the wet sheet is omitted, and a feather-bed is always considered to be necessary over all. As soon as the packing is concluded, the window of the room is opened, and, to expedite perspiration, the patient is allowed a considerable quantity of cold water at short intervals. The head often gets very hot, and it may then be kept cool by the application to it of a wet towel. A little exertion on the part of the patient, as if trying to throw off his wrappings, will expedite the perspiration, which rarely breaks out sufficiently in less than two, three, or even four hours. After the packing the patient usually takes one of the baths mentioned in the last paragraph.

692. STEAM OR VAPOUR-BATHS are used in various ways in hydropathy, one of the most common and convenient of which is as follows:—The patient sits naked in a chair, and is then covered up with two large blankets, one of which is thrown over him from behind and covers the back of the chair, while the other invests the knees and front of the body. The blankets are pinned tightly round the neck, and should be

ample enough to hang down over the floor for some little distance. The patient being now comfortably settled, with his feet resting on a stool, a shallow pan, containing a quantity of boiling-water, is pushed under the chair, and into this a hot brick is dropped by means of a pair of tongs. The brick should be made as hot as possible, and the water should only be deep enough to cover its lower half, so that when it has caused a considerable quantity of steam to be given off, it may be turned in the water, which immediately produces a fresh supply. This bath is usually continued for ten or fifteen minutes, or sometimes for nearly double that period, during which time the patient should drink more or less of cold water, and if faint, his face may be wiped with a wet towel. Sometimes it is useful to pour a tablespoonful or two of vinegar upon the brick just before the patient comes out of his blankets, as it gives a stimulus to the skin, which is very beneficial in certain cases. Afterwards one or other of the cold water applications is used, or in some cases the patient is wrapped in hot blankets, and placed in bed until the perspiration and general excitement have subsided.

693. The Turkish Bath has within the last twenty years been extensively introduced into this country, large buildings having been opened for its use in most of our large towns. It often forms a part of the system in hydropathic establishments, though not originally belonging to Hahnemann's scheme. (See Appendix.)

Sect. 3.—The Advantages and Disadvantages of Hydropathy.

694. Among the advantages which this system claims, the novelty of several of its processes may be included. Of course, if any kind of plan can be proved to have undergone a fair trial without success, it is a *prima facie* ground for disbelief in its powers, just as I have alleged with regard to the principle of homœopathy; but I am quite ready to admit that in the "water cure," most of the processes are quite new, and several of them act quite upon a new principle. The shallow-bath is certainly merely the ordinary cold-sponging, carried out in a convenient method, and the plunge-bath has been adopted from time immemorial; but the various packing processes, the sitz-bath, the douche, and the compresses are, as far as I know, quite new in the art of medicine. If, therefore, there is any remedial power in them, hydropathy may lay claim to the advantage and credit of its discovery; and to Priestnitz in particular, it may be awarded.

695. Hydropathy is said to be useful as an *antiphlogistic*, as a *tonic*, and as a *critical* remedial agent.

(*a*) The *Antiphlogistic Treatment* by water is intended to reduce inflammation or fever, by lessening the heat of the skin, and reducing the rapidity of the circulation. It is adopted by means of the wet sheet packing, wet towel rubbing, pail douche, shallow-bath, rubbing sheet, and compresses, all of which are described at pages 204, 5, and 6. The *Wet Sheet Packing* is considered to be the most generally serviceable. In active inflammations and fevers, the patient is kept in the packing for fifteen or twenty minutes, and it is used twice or thrice in the day. It should never be employed when the surface of the body is cool, the pulse faint and low, and when there are symptoms of a tendency to exhaustion. The *Wet Towel Rubbing* is mainly useful in mild febrile or inflammatory attacks, for which it may be used two or three times a day with advantage, being continued about a minute each time, with the water at a temperature of about 60° F.; the patient returns to bed. The *Pail Douche* has been used with success, before the introduction of hydropathy, in the treatment of scarlet fever; but it is now adopted in the ordinary cases of inflammatory fever. It may be employed in the case of robust persons with good effect; but it is not calculated for weakly or nervous individuals. The *Shallow-bath* is likewise used in cases of fever and inflammation occurring in strong individuals. When the heat of the skin is great, and the pulse strong, the patient is put in, with the water at the temperature of 65° or 70° F., and his extremities are rubbed by the attendant. It is, however, a very uncertain and dangerous remedy in the hands of a person unacquainted with its powers. The *Rubbing Sheet* is applied in the early stages of fever and inflammation, before they are well established. The object is to equalize the circulation, and restore the general warmth of the body, and the natural volume of the pulse, by relieving the internal parts through the skin, which it is intended to act upon. The operation should last two or three minutes, after which the patient should dress, and take moderate exercise. The *Compresses*, when applied to the abdomen, will allay heat in cases of slight feverishness, and quiet the pulse. They are also useful in slight attacks of inflammation of the stomach and bowels.

(b) The *Tonic Treatment* by water is intended to improve the general health and strength of the body. Almost all the water processes are used as a means of giving tone; but some are considered to be better adapted than others to particular cases, and for their selection experience is required.

(c) The *Critical Treatment* is usually considered the grand advantage of the "water cure," and its advocates maintain that it acts also in this way, even when used as an antiphlogistic or tonic. All the baths are said, when frequently used, to have a tendency to produce boils and various other eruptions of the skin, as well as evacuations from the bowels, all of which, when they occur, are called "crises," and are supposed to be dormant matters, the product of disease or over-drugging, thrown out of the body, by the powers of nature provoked by the stimulus of the water. The *wet sheet packing*, however, is held to be the most powerful general agent in effecting a crisis, and the *compress* locally. The former is employed in almost all chronic cases after the strength has been improved by other milder plans and appliances, so as to justify the use of so powerful a remedy. It is sometimes the first application resorted to by the hydropathic practitioner; but it should always be adopted with great caution by any but a person of great experience of its power.

696. THE FOLLOWING PRECAUTIONS are those usually given by the hydropathic physician.

(a) So long as the patient gets a good reaction after a bath, it may be supposed to agree with him, except when it happens that, although the patient becomes warm immediately after the bath, yet some five or ten minutes after, or at various periods during the day, he has fits of shivering or chilliness, in which case the bath does not agree.

(*b*) In chronic cases, every bath, except that in the early morning, should be preceded, and every bath (without any exception) should be followed, by exercise.

(*c*) In acute cases, exercise must be omitted when the nature of the disease forbids it.

(*d*) The baths should not be taken until two or three hours have elapsed after a meal. They are generally administered two or three times during the day.

(*e*) Those who cannot warm themselves by exercise, either owing to lameness, or from other natural defect, may go into a hot air or vapour bath for a few minutes before the application of the cold water, the object being not to produce perspiration, but simply to warm the body.

(*f*) As the hydropathic treatment occasions considerable waste of the body, patients under the "water cure" must eat more than usual.

(*g*) *Hydropathy, to be successful*, requires the adoption of a plain diet, early hours, both in rising and going to bed, exercise in the open air proportionate to the strength, and a contented happy frame of mind.

(*h*) No allopathic remedies may be used during the treatment, but those of homœopathy may be taken.

(*i*) *Hydropathic treatment* frequently produces unusual sleepiness during the day, which should be indulged as it does good, and will not interfere with the night's rest. If, however, at the commencement of the "water cure," the patient feels more than commonly *languid* and *tired*, it is better to diminish the number and extent of processes for a time. Those, also, who at the commencement feel peculiarly light and buoyant in spirits, and as it were stimulated, should diminish their treatment, and increase the temperature of the water.

697. FROM THE ABOVE ACCOUNT it will be obvious that the "water cure" has also its attendant disadvantages, which are chiefly its great trouble and expense, and its consequent inapplicability to all but those who have plenty of money and time at their disposal. It can seldom be adopted successfully at the house of the patient, because it requires fresh air and good opportunities for exercise; and, when these are obtainable, the diseases for which it is chiefly applicable are not very rife. Comparatively few of us can leave home for months, and give up all our time to the treatment which is required; for fathers of families have generally some occupation, and mothers have their families to attend to. But to the hypochondriac, whose disease is very often mainly dependent upon his want of occupation, and consequent *ennui*, the "water cure" holds out many advantages, affording him plenty of bodily and mental amusement, and taking his thoughts out of himself to place them in his bath, his sheets, his towels, his walks, and his diet. Here there can be no doubt that good is derived; and many a worn-out dyspeptic has reason to bless the day when he first heard of the "water cure."

CHAP. V.

THE MECHANICAL TREATMENT OF DISEASE TERMED KINESIPATHY.

SECT. 1.—OBJECTS AND NATURE OF THIS MODE OF TREATMENT.

698. This branch of the healing art is not so ambitious as either of the two we have just examined, or as the old and recognised system of medicine; inasmuch as it merely pretends to a cure of chronic diseases, though by its improvement of the condition of the general health, it has a great tendency to prevent acute as well as chronic disease.

699. It comprises a system of motions and mechanical appliances adapted to diseased conditions of the body of a chronic character; and it depends on the theory, that if exercise is necessary to the maintenance of health, *specific exercises*, among other forms of treatment, are especially needed to restore the healthy action to parts, and subsequently to the whole. These curative effects are brought about by manipulations applied to the muscular and nervous systems, separately or together.

700. THERE ARE THREE METHODS OF ACTION or fundamental principles, by which benefit is derived from these manipulations, viz.—"*excitation*, *derivation*, and *roboration*. In the *first*, an endeavour is made to overcome a diseased state of organs or tissues by imparting vigour to the nerves and vessels connected with those parts, at the same time stimulating, as well as promoting, the reproductive processes. In the *second*, we seek by acting on the superficial or deep-seated nerves and vessels, to derivate the blood, either from the internal to external parts, or from any organ wherein a morbid circulatory action shall be established. Whilst, in the *third* form, we strive to diffuse a proper amount of innervation throughout the system, re-educating, as it were, the natural

functions, and thereby completing the work of a true curative agent."—(*Blundell's Medicina Mechanica*).

701. Such being the object of these medical mechanics, an attempt has been made by a Swede, of the name of Ling, to analyse the various physiological effects of movements; and he has come to the following conclusions, which have since been generally adopted in his native country, and enlarged upon by Professors Georgii and Branting. The theory and practice of this art was termed by its founder *kinesipathy*,—"1st, that the effects of these movements may be transferred to any part or organ of our organism; 2nd, that the strength of the movements may be modified and regulated from the most feeble to the most powerful; 3rd, that passive movements in general affect the sensitory and excito-motory phenomena of the nervous system and of the absorbents, and increasing thereby the absorption, advance the retro-metamorphosis (waste) of the organic textures; 4th, that active movements augment the activity of the arteries, and the innervation of the motory nerves; 5th, that they increase the animal heat; 6th, that they advance and support the progressing metamorphosis (repair) of the textures."—(*Georgii's Pamphlet.*)

702. Between the ordinary Gymnastic Treatment of disease and that by Ling's movements, there is this difference, which is considered of vast importance by him and his followers—namely, that in the former only active movements on machines are used, and these but empirically, without any anatomical and physiological basis, and as a consequence without much success, and even sometimes with manifest injury. In addition to this, the gymnastic treatment endeavoured only to cure external malformations, and was never intended to cope with internal diseases.

703. By the term Movement is to be understood every change of position and alteration of form, determined by time and amount, on the whole body or any part of it, and which may be produced by the organism itself (active movements), or by any animate or inanimate mechanical agent (passive movements).

704. Movements are used either hygeinically or medically. In the former case, they form an essential feature (as in Sweden) in general education, developing the body in a healthy manner, and tending to *prevent* disease. In the latter they are either the sole curative agents in the treatment of chronic disease, or form a very important accessory to internal remedies.

705. The Doctrine of Movements has been arranged by Ling in four principal groups, according to the state of the organism, and its relation to the external world.

1st. The Subjective Active State, which supposes the organism to be acting upon itself with its own force for the purpose of self-conservation and development. This is the base of the *pædagogical part*, by which we learn to subject the body to the influence of our own will, and by which the natural disposition to harmony in its various parts is developed.

2nd. The Objective Active State. In this the action is the result of a combination between our own force and one that is external, which latter is striving to bring on a reaction. This is the base of the *military part*, by which we learn to subdue, by the assistance either of external means (as weapons), or of our own bodily force, another will external to our own. Here the oneness of the body and the weapon are developed proportionately to the action of our opponent.

3rd. The Subjective Passive State. Here the body is in a diseased state, during which we are less able to act ourselves, but must remain passive, and receive a mechanical influence from without. This is the base of the *medical part*, by which we learn to allay or cure our pains and disorders, either of ourselves by a convenient position of the body, or with the assistance of others acting upon us by movements; whereby the harmony, which had previously been deranged by the respective irregular proportion, is restored in the different parts.

4th. THE OBJECTIVE PASSIVE STATE, in which we express by outward actions our feelings and impressions. This is the basis of the *æsthetic part*, by which we express actively our internal being, our thoughts, and feelings, thereby showing the harmony which exists between our intellectual and corporeal being.—(See *Roth's Cure by Movements.*)

706. EVERY MOVEMENT has—1st, a commencing position; 2nd, an intermediate; and, 3rd, a final position: and every definite movement has definite points—1st, in which it begins; 2nd, through which it passes; and, 3rd, in which it terminates.

707. MOVEMENTS ARE CLASSIFIED as *simple*, in which it is confined to one articulation, and *compound*, when its effect is propagated at the same time by degrees on two or more articulations; or, according to others, when it is apparently executed by many parts of the body.

708. THERE ARE ALSO DOUBLE MOVEMENTS, which occur in the limbs only, when those of opposite sides of the body are equally implicated; and *half movements*, which are executed by one arm or one leg, or by the lower or upper part of the body, while the corresponding part is idle. Thus, *half extended standing* is performed only with one arm; *half standing* is the position on one leg; *half lying* is the lying on the upper or lower half of the body, &c.

709. PARALLEL MOVEMENTS are where several limbs or parts are moved at the same time, with a common purpose in view—as, for instance, the friction on both sides of the chest.

710. PARTIAL MOVEMENTS are those which all influence in the same or a similar manner some determined parts or organs of the body. *General movements* are those which in the same manner influence the whole body.

711. REPEATED MOVEMENTS are when one and the same simple or compound movement is executed several times in succession.

712. RHYTHMICAL MOVEMENTS are when they are executed at exact intervals of time.

713. MOVEMENTS IN MOTIONS (*tempo*) differ from the rhythmical in not being executed with the same limbs, nor at equal intervals of time, which may be longer or shorter.

714. QUANTITY OF MOVEMENT refers to its continuity, extension, and intensity.

(*a*) Its *Continuity* may be—1st, equal; 2nd, increasing; 3rd, diminishing; 4th, increasing and diminishing; 5th, diminishing and increasing.

(*b*) In *extension*, the movement depends on the form of the articulations upon which it acts.

(*c*) The *intensity* depends both on the strength of the individual, and upon the end to be attained.

715. MOVEMENTS are *active*, *passive*, and *combined*, which last are again divided and sub-divided into *combined-active* and *combined-passive*; *combined-more-active*, *combined-less-active*, *combined-more-passive*, and *combined-less-passive*, &c., &c., &c., for the description of which I must refer to Ling, or Georgü, or to the volume published by Dr. Roth before alluded to.

716. ACTIVE MOVEMENTS when produced by an entire muscle, or a portion of it, or by a group of definite muscles are called *special active* movements, all others being called *general active.* They are also divided into *free movements* when independent of mechanical assistance, and *movements on machines* when they have their aid.

717. PASSIVE MOVEMENTS are those which are produced in the body while at rest, as in riding in a carriage, or sailing, &c.; or, they may be produced upon one part of the body while at rest, by another part rubbing or squeezing it.

718. COMBINED MOVEMENTS are partly the result of the will of the patient, and partly arising from the voluntary power of the operation.

SECT. 2.—PRACTICAL APPLICATION OF KINESIPATHY.

719. The following directions are given by Ling, a portion only being here introduced, in order to enable my readers to obtain some idea of the system, which, however, must be seen in

operation at the various "kinesipathic establishments" to be fully understood.

(*a*) The aim of these exercises is to develop the human body harmoniously by well defined movements.

(*b*) Our body so developed possesses real strength—that is, such strength as is equally distributed in all directions, and which enables us to support more easily the differences of temperature, bodily fatigue, and other external influences.

(*c*) A strength so distributed preserves us in good spirits, and makes all our movements easy.

(*d*) The exercises are divided according to the principal parts of our body, viz., into those of the arms, legs, head, and trunk; but as all these parts must be in perfect harmony, it is not a matter of indifference, whether we exercise ourselves only in certain movements, because our body would not so obtain the equal development desired.

(*e*) In the beginning, the positions must be learned.

(*f*) No movement is to be done with an effort.

(*g*) The breathing must not be suppressed during the exercises.

(*h*) The dress must be loose. The best dress for ladies is a blouse (*see fig.* 1), without stays or bustle, which become very soon superfluous, if these exercises are well done, and used in moderation. The dress of the male is shown in the subsequent figures.

(*i*) The movements with the head and trunk must be done slowly, as well as those of the legs, by which the body is raised or lowered; the more the strength and flexibility increase, the slower the above-mentioned movements must be executed.

(*j*) The movements with the arms are done quickly, and the quicker they are, the more the strength is developed.

(*k*) The movements must vary, and one and the same movement must not be repeated oftener than two or three times one after the other.

(*l*) The movements although changed must not be executed only and principally with one part, because these would become stronger than all the others, and would prevent the harmony of the body.

(*m*) The exercises must be performed by healthy persons, according to the numeric order of the tables of exercises we should not proceed to a following table before we understood the execution of the preceding one.

(*n*) Between the single exercises, an interval of half a minute to two minutes is desirable.

(*o*) Not more than ten to twelve exercises should be done at once each day.

(*p*) All persons who feel indisposed, or in whom one or another part is weaker, should consult the physician acquainted with the effects of movements, as to whether, and as to what exercises, they shall use, for otherwise exercises of this kind become injurious.

(*q*) The following exercises are called free movements, because they are executed without the help of any technical apparatus.—(*Roth*).

720. The positions of the body with respect to the basis are different, according to whether the feet touch each other, or there is a certain distance between them.

(*a*) *First position*—Rectangular, heel on heel—(*see fig.* 2).

(*b*) *Second position*—Feet close together.

(*c*) *Third position*—Right or left foot forward.

(*d*) *Fourth position*—Right or left foot completely forward.

(*e*) *Fifth position*—Feet alternately put completely forward.

(*f*) *Sixth position* — Feet placed apart in one, two, or three distances, &c.

(*g*) *Seventh position*—Hands on the hips.

(*h*) Various movements of the arms, as explained by the diagram (*fig.* 3).

(*i*) Striking out the arms (*fig.* 4).

(*j*) Arms extended backward (*fig.* 5).

(*k*) Movements of the head, consisting of flexion forward, backward to the left, &c.

(*l*) Movements of the legs—forward, backward, outward, inward, upward, and downward.

Fig. 1.

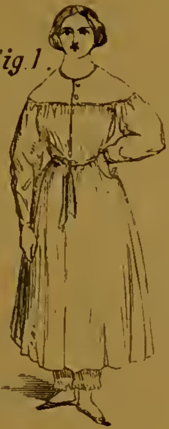


Fig. 2.

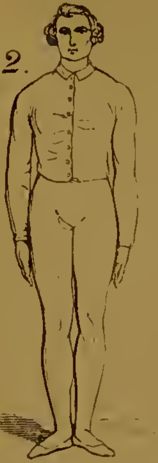


Fig. 3.

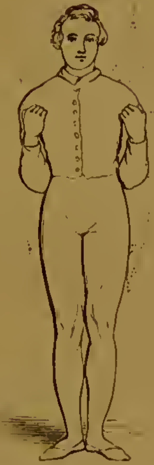


Fig. 4.

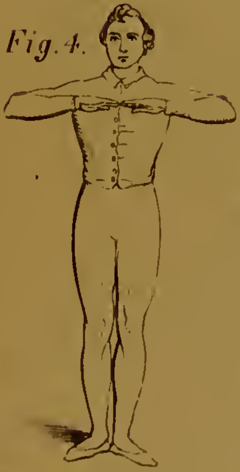


Fig. 5.

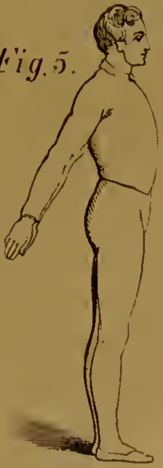


Fig. 6.

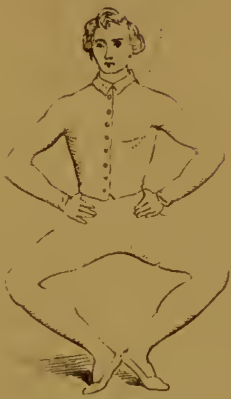


Fig. 7.

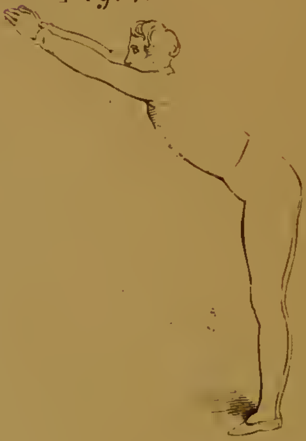


Fig. 9.

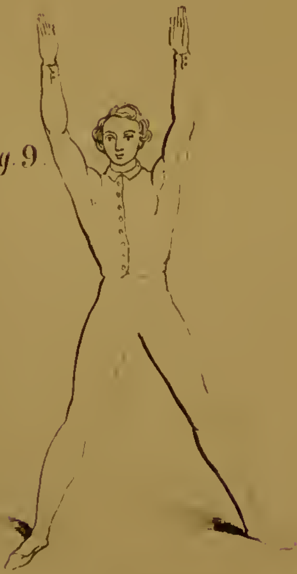
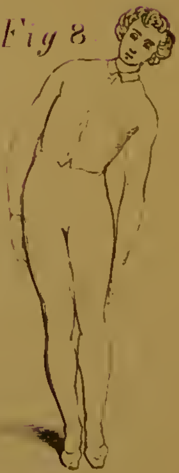


Fig. 8.



(*m*) Flexion of the knees (*fig.* 6).

(*n*) Hips forward in two motions.

(*o*) Movement of the trunk forward (*fig.* 7); sideways (*fig.* 8), &c.

721. THE COMMENCING POSITION is very important in every movement, because the effect depends in great measure upon this position. They consist in—1st, standing; 2nd, sitting; 3rd, kneeling; 4th, lying; 5th, depending. All of which are indefinitely varied; as, for instance, standing with the legs apart, and the arms extended upward (*fig.* 9), and half lying on the anterior surface of the lower limbs (*fig.* 10), as well as the horizontal extension of the whole body, while the feet and hands are fixed (*see fig.* 11).

722. THE TREATMENT OF SINGLE DISEASES is chiefly conducted by three classes of movements.

(*a*) *Derivative movements* on the legs and feet by active and passive rotation, coupled also with extension and flexion, are shown by *fig.* 12, in which flexion is commencing.

(*b*) *Movements* determining a greater flow of blood to the abdomen, which may be either passive or active manipulations of various kinds; as, for instance, the passive turning of the trunk from one side to the other, and *vice versâ*, in the high half-lying position (*fig.* 13).

(*c*) *Movements* which increase the action of the absorbent vessels in the head, to which belong the passive rotation of the head, rotation of the trunk, frictions of the head from before, backwards, circular percussions with the palm of the hand on the head.

723. OTHER PASSIVE MOVEMENTS are made by pressure (which may be flat pressure or point pressure), squeezing, shaking, vibration, knocking, tapping, clapping or slapping, chopping, sawing, kneading, stroking, flexion and extension, rotation and percussion.

724. ACTIVE-PASSIVE MOTIONS are effected on the thumb and fingers, wrist, elbow, shoulder, ankle, knee, head, and trunk, &c.

SECT. 3.—PROBABLE POWERS OF KINESIPATHY.

725. KINESIPATHY professes to be an important improvement on the gymnastic exercises previously employed for the development of the healthy body, the improvement consisting chiefly in the addition of medical control, and in the enlistment of the laws of anatomy and physiology to superintend the movements, in lieu of the rude practical guesses of the drill-sergeant or professor of gymnastics. By these means, it is asserted that great benefit can be derived from its various processes, not only in preventing and alleviating many of the ordinary chronic diseases of the body, but more especially in treating those muscular deformities which are now handed over to the mechanist or the orthopœdic surgeon. How far the art is capable of performing all its promises, I am at a loss to pronounce, as I have had no practical experience in the matter; but knowing well the benefit to be derived from frictions in many diseases, and particularly in curvatures of the spine, I can readily imagine that nearly all which is alleged can be done by the disciples of Ling. Like all other "hobbies," it is perhaps ridden very hard; but, at bottom, I have little doubt that a good useful road-horse is to be found.

726. The list of diseases which come under the operations of the kinesipathist is a long one; and it is this which gives the most suspicious appearance to the art. Generally speaking, when a newly projected scheme takes within its scope a very large sphere of operations, its actual utility is small in proportion; while, on the other hand, if it promises little, it is consistent with general experience to expect that little to be well done. Still this rule is not invariable, and in this case, the suspicion may not be well founded. One thing is pretty clear, namely, that kinesipathy can do no harm, and as its various movements require considerable attention to master them, and occupy the patient's body and mind for some length of time, it may reasonably be expected that, in that way, they will prove serviceable in chronic ailments. It will probably be found to be chiefly advantageous to

those who cannot be made to take an interest in any out-of-door amusements or sports, and who have only the choice between such an occupation as is here pointed out, and a subscription to a *gymnasium*, where persons of delicate health are apt to over-exert themselves, and thus receive more harm than good.

CHAP. VI.

QUACKERY AND OTHER POPULAR FALLACIES.

SECT. 1.—QUACKERY.

727. It has already been explained at paragraph 619, that by the term "Quackery" is generally understood either the use of remedies, of which the composition is kept secret, or the administration of some particular remedy in all cases, both for the prevention and cure of disease, or both of these together, as is so often the case in this country. Now, it is scarcely necessary to prove that such a medicine or combination of medicines as will perform all these various duties has never yet been found; and certainly, as far as our knowledge of disease leads us to believe, it is not likely to be found; and so we must refuse our assent to those unblushing specimens of fraudulent pretension which are every day presented to the notice of the public in the newspapers and other vehicles for advertisements. No doubt some of these articles are useful in their way, but all pretend to far more virtue than they really possess; and those who are induced by the specious promises held out to try any particular remedy, are generally robbed of their money, their time, and very often also of their health.

728. As an instance of the way in which the public are gulled into the use of these quack remedies, I may quote the following anecdote which lately happened to myself. A child of my own was suffering from torpidity of the liver, for which I had been prescribing grey powder for a few days. This came to the knowledge of a friend of my wife, who held up her hands in astonishment at my giving such a poisonous drug as mercury, expressing, at the same time, her determination never to treat her own children in such a way. In a few days, one of her sons happened to be present while my child was taking a powder, and I said to him, "Well, Charles, do you take physic as well as that?" "Oh!" said he, "my mamma always gives us our medicine when we are asleep;" and, on inquiry, I found that she was in the habit of giving them every now and then a "soothing powder," which I well knew contained calomel, and, in addition, opium. So I had the pleasure of convincing the lady by ocular demonstration, that she really did give her children mercury in a much more active form than I had given mine, and for weeks and months together without knowing it. The proof was easy enough, as far as the calomel was concerned; for I had only to ask her to produce one of the powders, which she readily did, and then in her presence I merely poured over it some lime-water, and at once converted the whitish-brown into a grey powder, the calomel being decomposed by the lime-water, and being converted into the oxide of mercury from the state of chloride. Such mistakes are common enough; and half of the pills and balsams warranted not to contain certain drugs are almost certain to be composed of the very things which they profess to avoid most carefully.

SECT. 2.—CLAIRVOYANCE AND MESMERISM.

729. One of the most extraordinary

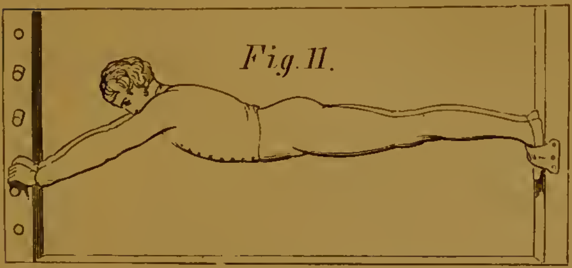


Fig. 11.

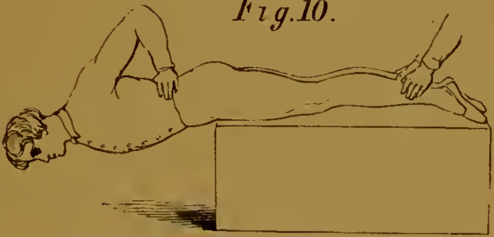


Fig. 10.

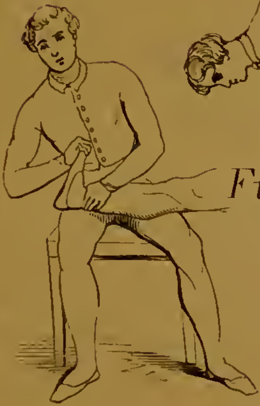
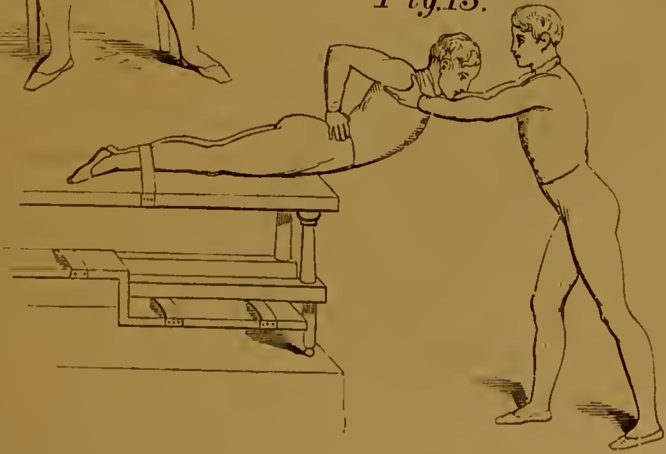


Fig. 12.

Fig. 13.



delusions of modern days is that which is mixed up with mesmerism by the name of "clairvoyance." Both profess to be useful in alleviating disease; and it is possible that mesmerism may be able to exert some power over certain diseases, called nervous; but with regard to its exact domain, we are very much in the dark, inasmuch as its practice has been so mixed up with fraud and imposture, that as yet we have not arrived at the truth. The world of late years has been divided into two great parties, one of which consists of the implicit believers in mesmerism, and every other novelty of the day, while the other, having been deceived in several instances, has resolutely determined to reject everything new, believing it to be for that reason untrue. Hence it has resulted, that there are few upon whose examination of the facts of any disputed subject implicit reliance can be placed; and even those who are really impartial do not gain the credit which they deserve, because they cannot readily prove their freedom from bias.

730. Mesmerism professes to be some occult power of influencing the nervous system of others by means of the passes, or even the will, of the operator. Certain individuals appear to possess this power much more highly than the average of mankind, while others are altogether destitute of it. Again, there are also many individuals whose nervous systems are so dull to all the impressions intended to be produced on them by the mesmerist, that no result follows, and after hours of attempted mesmerizing they remain in *statu quo*. When the effect is really produced, a deep sleep first takes place, which is followed in many cases by the manifestation of certain phenomena, the extent and nature of which are not accurately known, but which I believe may be safely assumed to go the length of insensibility to pain, local or general catalepsy, somnambulism, and its accompanying conversational power during that state. Whether the individual requires to be demesmerized, in order to awake from this state, or whether it will disappear of itself, is a point which admits of doubt; but there is strong evidence for the belief that the person who produces the mesmeric trance is most capable of removing its effects with certainty and safety.

731. With regard to the curative powers of mesmerism, I am unable to give any opinion, because, although I have had strong evidence of its good effect in certain cases, yet it was always of a nature which rendered it open to the suspicion of being wholly imaginary; and I, therefore, could never come to any conclusion on its agency, when independent of the influence of hope. It is not like the homœopathic globules, capable of a ready test; and although it is contrary to our preconceived ideas of the nature of the nervous power, yet as that is at present wholly beyond proof, and only goes to the extent of hypothesis, it is not logical to assume that it cannot be as the mesmerists assert, because we do not understand the "how and the why." All that can be said is that its remedial powers are "not proven."

732. But Clairvoyance is a step far in advance of mere mesmerism, though one of its so called developments. It does not merely profess to be an agent capable of acting remedially, but also of answering all questions on every subject with positive accuracy, so that it is easy to test it in every-day matters of fact; and if it fails in these, it can scarcely be expected to succeed in such abstruse subjects as the nature of particular diseases, and the proper remedies for them, which is the scope proposed for clairvoyance by many of those who believe in it. Thus, Mr. Atkynson, in his letters to Miss Martineau, says—"No one knows better than yourself how these *clairvoyant* powers have been manifested in a variety of forms, in all periods of history, and with all nations. We know that future events are foreseen in dreams and in trances, sometimes under the influence of mesmerism, and by some apparently in the ordinary condition of their lives. We know that some can see distant objects without the use of the eye;

and that others can see, so to speak, through opaque objects readily what is written in a closed book, and even the thoughts which are passing in the mind of another. We know that many under mesmerism can describe any diseased condition in themselves, and in others within the sphere of their vision—that they have an instinct of remedies—when a crisis will occur, and the cure will be effected. They do not go by any system, but by an instinct, so to term it, of the peculiar temperament and wants of each particular case. There are some who have detected the properties of herbs and of other substances, and can observe the structure, condition, properties, and uses of parts of the animal frame. Whatever doubts any one may have as to the truth of any of these particulars, the general fact has now been so clearly exhibited in almost every portion of the civilised and uncivilised world, that, without regard to my own experience, I presume I may say that, in a general way, the fact is established. With such a host of notorious instances on record, it is difficult to conceive that any enlightened person would dispute it; but there are persons, even in this great metropolis, who talk upon this subject, as if they had been born, bred, and dwelling in an obscure country village, subject to its arrogant conceits and contracted sights." (*p.* 51.)

733. Here, then, is what the believers in mesmerism and clairvoyance consider to be the powers and province of these exalted conditions. Now, it is clear that they are very wonderful, if true; and the first thing which the unprejudiced inquirer looks to, is the nature of the authority upon which they are brought before him. If it is by a set of men who make a profit of the subject, he dismisses it from his mind as unworthy of his attention; but, on the other hand, when such men as Mr. Atkynson assert that these apparently incredible facts have happened within their own knowledge, the next thing is to test their accuracy in the most simple manner possible, and by means which are as free from doubt and collusion as it is possible to make them. For this purpose, then, two or three experiments would suffice; and having been tried, and the powers of the *clairvoyant* found wanting, all faith in the pretended power has been lost. Thus, certain things have been enclosed in a wooden box, carefully sealed, and the *clairvoyant* has been asked to discover their nature; words have been written on thick paper, and folded up, so as to be invisible by even the strongest transmitted light; and, lastly, a bank-note for £1,000 has been deposited in the Bank of Ireland, at Dublin, which was to be the prize of the *clairvoyant* who could give its exact number. But, alas for the mesmerists, their boasted powers failed in all these tests, and they have been convicted of incapacity on the clearest evidence. Some of those who exhibited in public were, without doubt, very clever in their vocation; and could astonish their simple-minded audience by their guesses, which were aided by some preconcerted signals made by a confederate; but nothing which has ever yet been done in public is more wonderful than the feats of the "professors of magic," who every now and then show what they can do in the production of live canaries out of eggs; rabbits, &c., by the bushel, out of hats; and wedding-rings out of the middle of oranges. Here, as in the case of homœopathy, the little grain of truth is enveloped in so many bushels of chaff, that it is completely overwhelmed, and the sober portion of the community has been disgusted, and compelled to relinquish all connection with so mendacious a system.

SECT. 3.—PHRENOLOGY.

734. From the etymology of the word *phrenology*, it might be supposed to be merely the science which teaches the nature of the mind; but, instead of this, according to the intentions of those who introduced the term and who are the originators of the new system, it means, in addition, the art of detecting the nature of the mind by the external shape and size of the brain, as shown through its envelope, the human skull.

735. PHRENOLOGY can only be considered as a curative agent, if it really possesses this mechanical power of ascertaining the nature of the mind, for otherwise there is no means of connecting, *during life*, the parts of the brain with the faculties of the mind which are said to correspond with them, and without this knowledge of the mind thus obtained, its correct treatment is by no means improved. If we can only arrive at a knowledge of the mind by the *mental* manifestations, we are doing no more than has long been effected; but if phrenology can do more, and can discover the nature and extent of each mental faculty, by comparing the form of the skull with the standard condition of the brain, a great step might be gained; and we should be able to educate the dormant faculties and repress those which are exuberant, so as to produce a perfect mental phenomenon. Hence it might prove in the treatment of mental diseases to be of the greatest value, and at all events it would be desirable to cultivate a knowledge of its powers.

736. GALL AND SPURTZEIM, the inventors of the new philosophy of the mind, and of the practical application of it by means of the examination of the exterior of the skull, deserve great credit for their discovery of a superior method of dissecting the brain. By its means they have shown that certain portions of it are connected with certain mental phenomena; and they have proved, in short, that the mind is the result of the action of the gray matter on the surface of the cerebrum; while they have also shown that there is reason to believe that, in proportion to the comparative size of certain parts of the cerebrum is the development of the set of faculties which they assign to each. But when they have attempted to split up these regions into small sections, and to locate half a dozen faculties within the space of a square inch, our belief in the science is stretched to such an extent as to require the strongest proofs of its accuracy; and thus it happened, that while in theory phrenology delighted the scientific inquirer into the physiology of the mind, in practice he was disgusted with the crude assertions and dogmatic presumption of the new system, where all were professors and none had the modesty of the true student. It was assumed that the map of the brain set out by Gall and Spurzeim was necessarily correct, and that no further investigations were necessary; and, acting on this map as a truthful basis, the phrenologist deemed that a knowledge of anatomy and physiology was needless, and that the ordinary observer of the exterior, with a little practice and tact, could rival the original discoverers in the correctness of their decisions as to the conditions of individual characters. These men were wholly incapable of a knowledge of the difficulties attending on the practical application of the theory, even if true, and could not be expected to take into their consideration the fact that many portions of this gray matter are not in contact with the exterior at all, and that others are so wrapped up in convolutions as to bear no relation, in point of surface, to that of the skull beneath which they lie. As a consequence, therefore, partly of the inherent difficulties of the system, and partly of the ignorance and presumption of its professors (after the death of Gall and Spurtzeim), the science fell into disrepute. It was found, on carefully testing the powers of those who put themselves forward as its advocates, that they were utterly incompetent to discover more of the mind than Lavater and his followers had long been able to do through the general expression of the face and head. Hence it resulted, that even what had been really effected by the investigations of Gall and Spurtzeim were neglected, and that the failure of the practical art had carried with it the beautiful theory to which Gall himself would probably have limited his attention. Nevertheless, although most clever in its design, and I believe true in its theories, it is of no use at present in educating the healthy mind, or in remedying its diseased conditions; and so, for present purposes, it may be dismissed as an utterly useless fallacy.

CHAP. VII.

CONCLUSIONS TO BE ARRIVED AT AS TO REMEDIAL AGENTS.

737. From the foregoing remarks on the various systems which are now in vogue for the removal of disease, it may be gathered, that I can see no grounds for the belief that the old and long standing methods have in any way been superseded by homœopathy, hydropathy, kinesipathy, or clairvoyance. At the same time, I have been ready to admit, that serious errors in practice have crept into the orthodox system, in consequence of the over-anxiety of medical men to do something which may bring credit to themselves and relief to their patients. Nothing is more trying to the *amour propre* of the physician, and to the humanity of the man, than to be compelled to confess that he is ignorant of any remedy which shall be likely to do good in certain cases; and the consequence is that most of us, rather than admit this even to ourselves, go on trying one remedy after another, forgetting too often that, during the time, the remedy (if an "opposite") is doing more harm than the disease, or sometimes, if "like," it may be actually increasing it. All these defects, however, are only in the *practice*, and have no reference to the principles of the art of healing; and thus it may be made clear that the true lover of his species has a clear task to perform in reference to medicine, consisting rather in purging the art of all its defects, and not in trying to decry it altogether, and substituting a fallacy in its place. This last is the course taken by many in the present day, who defend themselves by asserting "that anything is better than over-drugging," and so possibly doing nothing may be, which is what they mean by anything. But then let things be called by their right names, and do not lead people to depend upon a rotten reed in severe and dangerous cases, when they require a firm support. With regard to hydropathy, it may be made very generally useful, to a certain extent; but it can never be carried out fully, except when under the control which is exercised in the regular hydropathic establishments. Here, however, it is unfortunately made very expensive, both in time and money; and it is not, consequently, applicable, except to the rich and idle portions of mankind. It is also too often made a trade, and converted from an aid to a principal, and when that is the case its practitioners should be carefully avoided. With regard to quackery, mesmerism, clairvoyance, and phrenology, my belief is that they are all to be classed together as fraudulent pretences, although each may contain within itself certain fundamental truths.

738. In carrying out these conclusions, I should, therefore, strongly advise the selection of a regular medical attendant, who is not tempted by making a profit on his physic to prescribe more of it than is required, and who is believed to be a man of superior attainments, and at the same time possessing ordinary industry and habits of business. If, unfortunately, such a man cannot be selected, either from the remoteness of the habitations of those who are the subjects of disease, or from a deficiency in the pecuniary means necessary to procure his attendance, then the next best thing is for the father or mother, or some other friend, to make the best of those faculties of observation committed to them by their Creator. In such a case, however, it is still more necessary than in that case of the physician to remember that, where there is much doubt as to the propriety of any proceeding, it is better to do nothing.

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PART II.

THE PRACTICAL APPLICATION OF THE PRINCIPLES OF THE HEALING ART.

BOOK I.—THERAPEUTICS.

CHAP. I.

THE PURCHASING, PRESERVATION, AND DISPENSING OF DRUGS.

SECT. 1.—PURCHASING AND PRESERVATION OF DRUGS.

739. BY THE TERM THERAPEUTICS, we understand the science which treats of the cure or palliation of disease, either by means of drugs, or surgical appliances, or diet, or in fact any other agent whatsoever. It is usual to class remedies for disease under the heads of medicines, medical hygeine and surgical appliances; and this method will be adopted here, omitting all remedies which are of such a dangerous nature as to be more than usually liable to abuse. It is notorious that even those of the mildest kind may be used improperly, and indeed often are so; but as it is also evident, from constant experience, that mothers of families as well as fathers, and old maids and old bachelors also, will quack themselves and their friends when they will let them, it is better to afford them sound and useful advice on the subject than to leave them to grope their way in the dark, or to apply to those who are, perhaps, quite as ignorant as themselves, and not always quite as honest.

740. IN PURCHASING DRUGS, whether in a raw state or in the form of extracts, tinctures, &c., it is very important to obtain them from a respectable house, who will then always take care that the article is genuine and properly labelled. The adulteration of drugs is enormously carried on, and, as commonly sold, the strength is seldom above one-half of what it ought to be. Besides this, there is the danger of the substitution of a cheap drug for a dear one, as in cod-liver oil, for which common fish oil is often sold, or in that of quinine, which is replaced by salicine, costing less than a quarter of its price, and being almost valueless as a tonic. The public are, therefore, completely dependent on the honesty of the vendor, as of course they cannot be supposed to be able to distinguish for themselves between good and bad drugs, nor even can they tell one kind of rhubarb from another, although the wholesale price varies 75 per cent., and the effects in as great a proportion.

741. DRUGS are most of them soon spoiled by keeping, and in all cases they should be preserved in well-stoppered bottles, with the exception of some few, such as Epsom salts, nitre, soda, &c., which will keep without injury for an indefinite time. All vegetable medicines lose their virtues in the course of a few months, if not carefully closed from the air; and even in bottles they seldom keep good for a year. It is, therefore, desirable to purchase them in small quantities at a time, and to renew them at intervals of twelve months. Tinctures will keep for a much longer time; but even they, in the course of years, lose a portion of their properties; though, at the same time, as the spirit evaporates, they become more concentrated, and consequently stronger in a given quantity, until the virtues become lost by keeping. Thus laudanum, when imperfectly corked, is often increased in strength fully one-half, or even more, the spirit escaping at the cork, and the opium itself remaining behind. I have often seen a small bottle of it, which was originally full, left at the end of a year or two with only one-sixth or one-eighth of its contents occupied by a thick and black fluid,

which is the concentrated landanum five or six times the original strength. This ought to be known and guarded against, or otherwise the most fatal results might occur, from giving a dose five times as great as was intended. In the case of children, and, indeed, in adults also, a mistake from this cause may easily make the difference between life and death.

SECT. 2.—TABLES OF WEIGHTS AND MEASURES, UTENSILS, AND TABLE OF DOSES.

742. APOTHECARIES' WEIGHT.—This is essentially the same as troy weight, but differently divided. By its scale all medicines are compounded, but drugs are bought and sold as such by avoirdupois weight.

1 grain (gr.)	=			1.097 grains avoirdupois	=	0.0648 grammes.
20 grains	=	1 scruple (℈)	=	21.94 ,,	=	1.296 ,,
3 scruples	=	1 drachm (ʒ)	=	65.82 ,,	=	3.888 ,,
8 drachms	=	1 ounce (℥)	=	526.628 ,,	=	31.102 ,,
12 ounces	=	1 pound (℔)	=	13 oz. 2 drs. 1 scruple 9¼ grains avoirdupois.		

743. MEASURES USED BY APOTHECARIES IN ENGLAND.

1 minim (M)	=0.05915 of a millilitre.		
20 minims	=1 fluid scruple (f℈)	=20 gr. avoirdupois	=1 1-5th millilitres.
3 fluid scruples	=1 fluid drachm (fʒ)	=1 dr. of water	=0.003549 litre.
8 fluid drachms	=1 fluid ounce (f℥)	=1 oz. of water	=0.02839 litre.
20 fluid ounces	=1 pint (O)	=1¼ lb. of water	=½ a litre, or rather more.
8 pints	=1 gallon	=10 lb. of water	= {277.274 cubic inches, or about 4½ litres.

744. THE FOLLOWING ARE THE MEASURES OF WEIGHT AND CAPACITY used in France :—

(*a*) FRENCH MEASURES OF WEIGHT.—The unit used in weighing is the gramme, which has been fixed by law, and is equal to the specific weight of the distilled water contained in one cubic centimètre. The gramme thus fixed weighs 15.433 grains troy, and 16.924 grains avoirdupois ; while the kilogramme, which consists of 1,000 grammes, is found to be equal to 2 livres (pounds), 5 gros, 35 grains, 15-100ths poids de marc; and to 2 pounds, 8 ounces, 3 pennyweights, 6,355 grains troy; or 2 pounds, 3 ounces, 4 drachms, 16 grains avoirdupois weight, English. As the most common things of daily consumption are sold by weight in small quantities, a great difficulty arose in introducing this part of the system ; and the old denominations of weight have therefore been allowed to remain, with some modification in their actual value, taking the kilogramme as the basis. The kilogramme is divided into 2 livres, the livre is subdivided into 16 ounces, the ounce into 8 gros, and the gros into 72 grains. This new livre, therefore, exceeds the old one (poids de marc) by 2-100ths; so, to reduce kilogrammes into old measure, it is necessary to multiply by 2 and add 2-100ths. In the decimal system adopted in France, the prefixes for *multiplying* are Greek, and for *dividing* are Latin. Thus—

Deca	means	10	times.
Hecto	,,	100	,,
Kilo	,,	1,000	,,
Myria	,,	10,000	,,
Deci	,,	10th	part.
Centi	,,	100th	,,
Milli	,,	1,000th	,,

We have, therefore, the milligramme centigramme, decigramme, GRAMME, decagramme, hectogramme, kilogramme, and myriagramme as the names of the various weights.

(*b*) THE LITRE is the unit of all measures of capacity. It is a cubic decimetre = 16.028 cubic inches, or about 1¾ pint imperial of water nearly. A litre weighs exactly 1,000 grammes, or 1 kilogramme, at 32 degrees Fahrenheit, and with a 30-inch barometer. As in the weights, so here we have the same prefixes—namely, the millilitre, centillitre, decilitre, LITRE, decalitre, hectolitre, kilolitre, and myrialitre

—the proportions of which will readily be understood.

745. THE UTENSILS necessary for the domestic compounding of drugs, are—1st, *small scales and weights*; 2nd, *glass measures*; 3rd, *a Wedgwood mortar*; 4th, *a spatula or two, and a slab of glazed earthenware*. These are generally arranged in a *medicine chest*, which is made with compartments to contain them as well as the drugs most commonly used, or likely to be required at short notice.

(*a*) THE SCALES AND WEIGHTS which are used for this purpose are of brass, and only capable of weighing drachms, scruples, or grains. The marks employed are given in the tables, so that by their aid any prescription may be made out by those who understand the rudiments of Latin, remembering always that the numerals are Roman, the final (i) being written with a tail, thus, (xij). In addition to these, (ss) stands for *half*; and (ā or ana) for *of each*; (M) being the abbreviation for *misce*, mix; and (c̄ or cum), in English *with*, being frequently used.

(*b*) GLASS MEASURES are of two sizes, called the drop measure and the ounce measure. The former is tall and thin, and is divided into 60 minims, the whole being marked at the top with the sign used for the drachm (ʒ). The ounce measure generally contains about three or four ounces, and is divided into drachms (ʒ), ounces (℥), and table-spoonfuls, each of which last are equal to half an ounce. For these glasses, which are intended for domestic use, it is always better to have them marked with the signs used by apothecaries on one side of the scale, and on the other with *tea-spoonful* equal to one drachm, *dessert-spoonful* equal to two drachms and a half, and *table-spoonful* equal to half an ounce. In this way, the variation in the capacity of differently-shaped spoons does not affect the dose of medicines, as they may always be measured out by the glass measure, and will then give an accurate result.

(*c*) THE WEDGWOOD MORTAR is employed for dissolving any saline matter or extract in water or other fluid when time is of consequence; or it may be used for mixing powders when dry, or for incorporating together extracts or powders, so as to form a mass for pills. For regular dispensing, a brass mortar is used for the last purpose; but the Wedgwood make is quite sufficient for domestic use. When strong mineral acids or nitrate of silver are employed, a glass mortar is the proper article.

(*d*) A SLAB OF EARTHENWARE AND A SPATULA are necessary for mixing together, and afterwards dividing, powders, pills, and ointments. A small spatula is useful for powders and pills, while a larger one is required for ointment. When a compound powder has been well mixed in the mortar, or, if small, on the slab with the spatula, it is more easily divided into equal portions by means of the spatula, various simple methods being adopted—as, for instance, either by heaping up similar little heaps of powder in the papers, adding to one, and subtracting from another, until all are alike—or else by spreading out the powder and patting it flat, after which the spatula is drawn across it in straight lines, according to the number required. In making pills, a mass of a proper consistence, in point of tenacity, is first made, either in the mortar or on the slab; and, by means of syrup, confection, or water, according to the nature of the ingredients This mass is then rolled out into a long thin roll with the spatula; after which it is first halved, and then again subdivided into halves, quarters, &c., until the desired number of portions corresponding with the intended pills is obtained. These being more or less square in form, are each rolled between the fingers until they become round, using magnesia or liquorice powder in all these operations, to prevent them sticking to the spatula, slab, or fingers. A pill machine is employed by those who make large numbers of pills, but it is not necessary for domestic use. Ointments are merely rubbed on the slab with the spatula until the various ingredients are thoroughly mixed.

SECT. 3.—LIST OF DRUGS SUITED TO DOMESTIC USE, AND TABLES OF PROPORTIONATE DOSES FOR DIFFERENT AGES,

From GAUBIUS, *&c.*

						Examples.	
Under	½	year	1-15th of a full dose	Grs.	¾	1¼	2
,,	1	,,	1-12th ,,	,,	1	1¾	2½
,,	2	,,	1-8th ,,	,,	1½	2½	4
,,	3	,,	1-6th ,,	,,	2	3½	5
,,	4	,,	1-5th ,,	,,	2½	4	6
,,	7	,,	1-3rd ,,	,,	4	7	10
,,	14	,,	1-half ,,	,,	6	10	15
,,	20	,,	2-3rds ,,	,,	8	13	20
Above	21	,,	the full dose	,,	12	20	30
At	63	,,	11-12ths ,,	,,	11	18	28
,,	77	,,	5-6ths ,,	,,	10	16	25
,,	100	,,	2-3rds ,,	,,	8	13	20

The following is another Table:—

Age—Years	80	65	50	25-40	20	16	12	8	5	2
Doses	⅝	¾	⅞	1	⅞	¾	⅜	½	⅜	¼

Months	12	6	2 to 1
Doses	1-5th	1-8th	1-15th, 1-24th

Adult women require about 3-4ths the full dose of men.

Sex, temperament, constitutional strength, and the habits and idiosyncrasies of individuals must be taken into account. Nor does the same rule apply to all medicines. *Calomel*, for instance, is generally borne better by children than by adults; while *opium* affects them more powerfully, and requires the dose to be diminished considerably below that indicated in the above tables.

746. ACACIA GUM.—*Exudes from the bark of various species of acaciæ; imported from Egypt and different parts of Africa.*

(*a*) *Physical properties.* — Irregular fragments of a pale yellow colour, semi-transparent, insipid, inodorous, soluble in water, but not in alcohol.

(*b*) *Therapeutical effects.*—Emollient and soothing.

(*c*) *Used* in catarrhs and other irritations of mucous membranes; also to suspend insoluble substances in liquids.

(*d*) *Dose.*—Half a drachm upwards.

747. ACID.—An union of oxygen with some other substance, and having a sour taste.

748. ACID, ACETIC.—*Vinegar distilled from wood, and purified.*

(*a*) *Physical properties.* — Limpid, colourless, volatile; odour, pungent and fragrant; taste, acid; specific gravity, 1.048.

(*b*) *Therapeutical effects.*—Stimulant, escharotic; but when diluted with water, cooling.

(*c*) *Used* in lotions for cooling purposes, diluted with water; also in ringworm and removing warts.

(*d*) *Dose.*—It is not given internally, except in combination with other remedies.

749. ACID, ACETIC (*diluted*). — *Diluted acetic acid, prepared from the acid,* par. 748.

(*a*) *Physical properties.*—A clear acid fluid; specific gravity, 1.008.

(*b*) *Therapeutical effects.*—Astringent, antiphlogistic, diaphoretic, and antiseptic. It is useful in making the acetate of lead more soluble. Externally, it is stimulant in its full strength, or when mixed with water, cooling.

(*c*) *Used* in fevers internally; or as a gargle with capsicum; or as an inhalation in sore throat. A useful lotion when mixed with spirit and water, in bruises, sprains, and burns.

(*d*) *Dose.*—Half drachm to 1 drachm.

750. ACID, CARBOLIC.

(*a*) *Physical properties.*—The pure anhydrous acid is in long colourless prismatic crystals, often showing a shade of pink or mauve colour after a time. It deliquesces when exposed to air, soon becoming liquid. Its smell resembles that of tar. It is very poisonous, and is caustic and antiseptic. The impure is more or less tinged with brown.

(*b*) *Therapeutical effects.*—Not used internally. Externally caustic and antiseptic.

(*c*) *Used* in toothache and in foul ulcers, also as a disinfectant. (See APPENDIX.)

751. ACID, CITRIC, *prepared from the juice of lemons.*

(*a*) *Physical properties.*—Sharp acid taste, white semi-transparent crystals of a rhomboidal shape. Specific gravity, 1.617; decomposed by heat; soluble in twice their weight of cold, and half their weight of boiling water.

(*b*) *Therapeutical effects.*—Antiphlogistic, refrigerant, and antiseptic.

(*c*) *Used* in febrile and inflammatory complaints; dissolved in water as a substitute for lemon juice, and added to soda to form the common effervescing draught.

(*d*) *Dose.*—10 grains to one scruple; 15 grains of the acid neutralize 20 grains of bicarbonate of soda, to form the effervescing draught.

752. ACID, GALLIC, *prepared from galls.*

(*a*) *Physical properties.*—A powder of a nearly colourless semi-crystalline appearance, dissipated by heat, dissolves in water and spirit.

(*b*) *Therapeutical effects.*—Astringent.

(*c*) *Used* in discharges of blood and in diarrhœa, and in other mucous discharges. Also in hemorrhoids.

(*d*) *Dose.*—2 to 5 grains. As an injection half a drachm dissolved in one ounce of water; as an ointment, 20 grains are mixed with an ounce of lard, with the addition of 30 or 40 grains of powdered opium.

753. ACID, HYDROCHLORIC, *formerly called muriatic acid, obtained from common salt.*

(*a*) *Physical properties.*—Emits a white, acrid, and suffocating vapour, on exposure to the air; taste intensely acrid and caustic; colourless, when pure; but usually is of a straw colour from the presence of peroxide of iron, or nitrous acid. Specific gravity, 116.

Not used in its full strength.

754. ACID, HYDROCHLORIC (*diluted*).—*The above acid, mixed with three times its bulk of water.*

(*a*) *Physical properties.*—The same as the full acid, but weaker, which see.

(*b*) *Therapeutical effects.*—Tonic, antiseptic, and partially diuretic, by promoting all the secretions.

(*c*) *Used*, when combined with diluted nitric acid, in affections of the liver; also with bitters, to prevent the generation of worms; in gargles for sore throat.

(*d*) *Dose.*—20 minims to 40.

755. ACID, HYDROCYANIC (*diluted*).

(*a*) *Physical properties.*—A transparent, colourless, and limpid fluid, with a strong odour of bitter almonds.

(*b*) *Therapeutical effects.*—Sedative, lowering the action of the heart, and allaying irritability of the mucous membrane.

(*c*) *Used* in coughs of all kinds, including hooping-cough; in irritability of the stomach, and neuralgia. Externally, it is useful in allaying itching of the skin. *Too powerful for domestic use.*

(*d*) *Dose.*—2 minims to 3 in almond mixture or bitter infusion. If the full action is required, it should be given with distilled water. POISONOUS in large doses.

756. ACID, NITRIC, *or aqua-fortis.*

(*a*) *Physical properties.*—Very acid and corrosive; fumes strongly with a suffocating odour; evaporates entirely by heat; when pure colourless, but often yellowish from the presence of nitrous acid; absorbs water from the air, tinges the skin yellow. Specific gravity, 1.42.

(*b*) *Therapeutical effects.*—Strongly caustic.

(*c*) *Used* only externally, for the removal of excrescences—such as warts, also for certain ulcers not commonly met with, and for carious teeth, *all requiring the greatest care.*

757. ACID, NITRIC (*diluted*).—*The above mixed with nine times its bulk of distilled water.*

(*a*) *Physical properties.*—The same as the above, varying only in degree. Specific gravity, 1.082.

(*b*) *Therapeutical effects.*—Tonic, antiseptic, and when given with diluted hydrochloric acid, useful in torpid condition of the liver.

(*c*) *Used* as a drink, largely diluted, in typhus fever (1 drachm to a pint of water), in chronic affections of the liver, and dyspepsia.

(*d*) *Dose.*—5 minims to 20.

758. ACID, SULPHURIC, *or oil of vitriol.*

(*a*) *Physical properties.* — A dense, transparent, colourless, very acid, and oil-like fluid, inodorous, and excessively corrosive; attracts water from the air. Specific gravity, 1.843.

(*b*) *Therapeutical effects.*— Stimulant and escharotic.

(*c*) *Used* for the bites of venomous animals.

759. ACID, SULPHURIC (*diluted*).—*The above mixed with about eleven times its bulk of water.*

(*a*) *Physical properties.*—Strong acid taste, inodorous, colourless, and transparent. Specific gravity, 1.103.

(*b*) *Therapeutical effects.*—Tonic, astringent, and antiseptic.

(*c*) *Used* in dyspepsia; also to check sweatings, salivation, and diarrhœa; likewise as a gargle.

(*d*) *Dose.*—10 minims to 30, diluted largely (2 drachms to 8 ounces), as a gargle, with honey, sage, &c.

760. ACID, TARTARIC.

(*a*) *Physical properties.*—Colourless, imperfect crystals, inodorous, very acid, soluble largely in water.

(*b*) *Therapeutical effects.*—Refrigerant, antiseptic, diuretic, and slightly aperient.

(*c*) *Used* in fevers, &c., with some soda or potass, as an effervescing draught, instead of citric acid; the proportions being the same (see CITRIC ACID).

(*d*) *Dose.*—15 grains to 25.

761. ÆTHER, SULPHURIC.

(*a*) *Physical properties.* — A limpid, volatile, inflammable fluid, without colour, produces great cold by evaporation; taste, peculiar, but hot and pungent; sparingly soluble in water, readily so in alcohol. Specific gravity, 750. Dissolves camphor, resin, caoutchouc, and fat.

(*b*) *Therapeutical effects.*— A diffusible stimulant, afterwards narcotic and antispasmodic; externally cooling; when inhaled producing anæsthesia.

(*c*) *Used* in hysteria, faintings, asthma, and other spasmodic complaints.

(*d*) *Dose.*—20 minims to 60 in water.

762. ALOES, BARBADOES.—*The inspissated juice of the cut leaf of the aloe spicata; imported from the Cape of Good Hope and West Indies.*

(*a*) *Physical properties.* Of a dark brown colour, and shining resinous surface, with a strong disagreeable odour, and very bitter taste; very difficult to powder, and soluble in diluted alcohol.

(*b*) *Therapeutical effects.*—A stimulating purgative, producing its chief effects on the lower bowels. Apt to produce and aggravate hemorrhoids.

(*c*) *Used* in dyspepsia and in head-affections; also as a common purgative.

(*d*) *Dose.*—One-fourth of a grain to 5 grains, well powdered, or dissolved in hot water.

763. ALOES, HEPATIC.—*An uncertain species.*

(*a*) *Physical properties.* — A liver-brown coloured extract, opaque, with a dull and waxy fracture; taste very bitter; smell peculiar, but not fragrant; powder of a golden colour.

(*b*) *Therapeutical effects.*—A stimulant aperient, somewhat stomachic and, like the last, apt to engender hemorrhoids.

(*c*) *Used* like the last.

(*d*) *Dose.*—1 grain to 5 grains, prepared as above.

764. ALOES, SOCOTRINE.—*Another doubtful species of aloe.*

(*a*) *Physical properties.*—A brittle extract, with a bitter taste; of a reddish-brown colour and aromatic odour. The fracture is usually smooth and shining, but sometimes a little rough. Easily reduced to a powder of a golden-yellow colour. Soluble in water and spirit.

(*b*) (*c*) (*d*) The same as the preceding article.

765. ALUM.

(*a*) *Physical properties.*—A semi-transparent, rough, irregular mass of saline matter; taste, acid-astringent. Soluble in 18 parts of water at 60 degrees, and in a little more than an equal weight of water at 212 degrees.

(*b*) *Therapeutical effects.*—Astringent and styptic.

(*c*) *Used* internally in hemorrhages and mucous discharges; externally, as a wash in opthalmia, or as a gargle in relaxed uvula.

(d) *Dose.*—10 grains to 20.

766. Almonds, Oil of.—*Obtained from the almond.*

(a) *Physical properties.*—An inodorous and tasteless oil, of a straw colour; easily mixed with water to form an emulsion, with yolk of egg or mucilage; soon spoiled by exposure to the air.

(b) *Therapeutical effects.*—Demulcent.

(c) *Used* in cases of irritant poisoning; also in bronchitis, mixed with other remedies.

767. Almonds, Sweet.

(a) *Physical properties.*—Soft, oily, and sweet taste; kernels brown outside, white within.

(b) *Therapeutical effects.*—Demulcent.

(c) *Used* in emulsion for slight chronic coughs.

768. Ammonia, only used in solution, except in combination with acids.

769. Ammonia, Liquor of.—*Ammonia condensed in water.*

(a) *Physical properties.*—A stimulating solution, with a strong smell of ammonia; acts on the skin with the power of a blister, or when reduced in strength as a rubefacient only.

(b) *Therapeutical effects.*—Stimulating, diaphoretic, anti-acid, when given internally; externally, irritant and escharotic.

(c) *Used,* when largely diluted, in faintings, asphyxia, hysteria, spasms, acidities of the stomach; and, externally, as an irritant of the skin.

(d) *Dose.*—5 minims to 15.

770. Ammonia, Muriate of.—*Now called the hydrochlorate.*

(a) *Physical properties.*—A solid, semi-crystalline mass, with a cool, acrid, and penetrating taste. Sublimates at 300 degrees. Soluble in three parts of cold water, and in its own weight of boiling water; also in five parts of alcohol.

(b) *Therapeutical effects.*—Slightly aperient and emetic, diaphoretic and diuretic; externally, rubefacient and cooling.

(c) *Used* chiefly externally, dissolved in water, for indolent tumours and for chilblains; also to procure a low temperature, as a freezing powder.

(d) *Dose.*—10 grains to 30.

771. Ammonia, Sesqui-Carbonate of.—*Ammonia united with carbonic acid.*

(a) *Physical properties.*—A mass of irregular crystals, somewhat resembling white sugar, but more transparent and striated. Smell, pungent; taste, sharp and alkaline; soluble in four times its weight of cold water; becomes opaque and friable on exposure to the air.

(b) *Therapeutical effects.*—Stimulating, antispasmodic, diaphoretic, and anti-acid.

(c) *Used* in dyspepsia, hysteria, and all diseases requiring a rapidly acting diffusible stimulant; externally, to the nostrils in syncope.

(d) *Dose.*—2 grains to 5, in pills, or dissolved in any fluid.

772. Ammoniacum, Gum.—*A natural exudation from the Coshak plant.*

(a) *Physical properties.*—In irregular dry masses, and tears; of a yellow colour externally, internally white; odour, peculiar; taste, nauseous, sweet, and bitter; forms emulsion with water of a whity-brown colour; soluble in vinegar and alcohol.

(b) *Therapeutical effects.*—Stimulating, expectorant.

(c) *Used* in asthma, and chronic bronchitis, especially in old people.

(d) *Dose.*—10 grains to 30, in pills or emulsion.

773. Aniseed, Oil of.

(a) *Physical properties.*—An oil of a bright straw colour, resembling the seeds in taste and smell.

(b) *Therapeutical effects.*—Carminative and stomachic; also slightly antispasmodic.

(c) *Used* in flatulence and colicy pains; also for infants and children when griped.

(d) *Dose.*—3 to 5 minims, rubbed down with sugar or mucilage.

774. Antimony, Potassio-tartrate of.—*Tartar emetic.*

(a) *Physical properties.*—A colourless, transparent, inodorous, crystallized salt, with a slightly metallic taste. Soluble in fifteen times its weight of cold water, and twice its weight of boiling water; insoluble in pure alcohol, but soluble in proof spirit or wine. The aqueous solution becomes decomposed by keeping.

(*b*) *Therapeutical effects.*—Emetic in large doses; diaphoretic in small ones; expectorant, slightly aperient and alterative; externally applied, produces a crop of pustules.

(*c*) *Used* to evacuate the stomach; also in pneumonia in large doses; as a diaphoretic in cutaneous diseases. Externally applied in the form of an ointment, to produce counter-irritation.

(*d*) *Dose.*—As an emetic, 1 grain to 4 grains in solution; in pneumonia, $\frac{1}{2}$ a grain to 1 grain, often repeated; as an expectorant or diaphoretic, $\frac{1}{8}$ of a grain to $\frac{1}{2}$ a grain.

775. ASAFŒTIDA, GUM.

(*a*) *Physical properties.*—A mass of irregular pieces, varying in colour from red or reddish-brown to white; odour resembling garlic, but more fetid; taste, bitter, and slightly acrid; difficult to powder, unless rubbed with carbonate of ammonia. Forms a milky mixture with water.

(*b*) *Therapeutical effects.*—Antispasmodic, expectorant, anthelminthic.

(*c*) *Used* in hysteria, flatulence, colic, &c.

(*d*) *Dose.*—5 to 10 grains.

776. BISMUTH, TRISNITRATE OF.—*The metal bismuth united with nitric acid.*

(*a*) *Physical properties.*—A white, tasteless, inodorous powder, very slightly soluble in water.

(*b*) *Therapeutical effects.*—Antispasmodic, stomachic, and tonic.

(*c*) *Used* in dyspepsia, attended with pain of the stomach, and water-brash.

(*d*) *Dose.*—5 to 10 grains.

777. BORAX.—*Biborate of soda.*

(*a*) *Physical properties.*—Sweetish, shining, efflorescent crystals, soluble in twelve parts of cold, and two parts of boiling, water.

(*b*) *Therapeutical effects.*—Absorbent, cooling, and alterative.

(*c*) *Used* in intestinal irritation of infants. Externally applied to thrush, and to cutaneous diseases.

(*d*) *Dose.*—5 grains to 30. Externally applied, dissolved in eight times its weight of honey or mucilage.

778. BUCHU.—*Leaves of the Bachu.*

(*a*) *Physical properties.*—Leaves of a strong peculiar smell, and slightly bitter but earthy taste; of an olive colour on the upper surface, pale and rugose below, where they are studded with minute glands.

(*b*) *Therapeutical effects.*—Tonic, diuretic, and sudorific; exerting also a peculiarly soothing effect upon the bladder and kidneys.

(*c*) *Used* in gout and rheumatism, but chiefly in chronic inflammation of the bladder.

779. CALAMINE (*prepared*). — *A native carbonate of zinc.*

(*a*) *Physical properties.* — A dull, pink powder; heavy, and insoluble in water.

(*b*) *Therapeutical effects.*—Astringent and absorbent.

(*c*) *Used* extensively to heal sores.

780. CALOMEL. — (See MERCURY, CHLORIDE OF.)

781. CAMPHOR. — *A peculiar substance, obtained by distillation from the wood of the laurus camphora.*

(*a*) *Physical properties.* — In large white semi-transparent cakes, with a strong, peculiarly fragrant, and aromatic odour; taste, bitter and acrid; feels unctuous to the touch; when broken presents a foliated or crystallized structure; is volatile, so as to disappear entirely in course of time; insoluble in water; soluble in alcohol, ether, acetic acid, and the fixed oils.

(*b*) *Therapeutical effects.*—Stimulant, diaphoretic, sedative; externally, soothing

(*c*) *Used* in hysteria, asthma, chorea, and generally in spasmodic diseases; externally, in muscular pains, bruises, &c.

(*d*) *Dose.*—3 grains to 5, in pills. When dissolved in water as camphor mixture, the quantity is scarcely appreciable.

782. CANTHARIDES.—*Blistering flies.*

(*a*) *Physical properties.*—An oblong green and gold body, with black antennæ; odour, fetid and pungent; taste, acrid.

(*b*) *Therapeutical effects.*—Stimulant, diuretic, and blistering.

(*c*) *Used* internally by medical men, but not adapted for domestic exhibition, being highly dangerous when employed in improper cases. Externally used as a blister; or to cause counter-irritation in a milder form; or to produce growth of hair.

783. CANTHARIDES, *dissolved in acetic acid.*

(*a*) *Physical properties.*—A dark brown solution, very pungent, and rapidly vesicating.

(*b*) *Therapeutical effects.*—Nearly the same as the plaster, but more rapid; and perhaps not quite so successful in producing a copious discharge of serum.

(*c*) *Used* for the same diseases, and with the same view; but brushed on to the skin with a glass brush sold for the purpose.

784. CANTHARIDES, PLASTER OF.—*Blistering plaster. Sometimes prepared in the form of a tissue paper, imbued with the active principle.*

(*a*) *Physical properties.*—The plaster is a firm preparation requiring the warmth of the hand to enable it to be spread upon leather or calico. It soon spoils by keeping; and if more than a month old should, after spreading, be dusted over with powdered cantharides.

(*b*) *The therapeutical effect* of this plaster is to raise the cuticle from the cutis, producing at the same time a large secretion under the form of serous fluid. The time occupied varies from 3 hours to 12, or even more. In babies the blister should always be carefully watched from the expiration of the former of these periods; after which it often rises rapidly, and if allowed to remain on longer would be liable to produce severe ulceration of the skin.

785. CAPSICUM.

(*a*) *Physical properties.*—Berries of a red colour, and an extremely pungent odour and taste, which is yielded to alcohol, ether, vinegar, and water.

(*b*) *Therapeutical effects.*—Stimulant, stomachic, and rubefacient.

(*c*) *Used* in dyspepsia, flatulence; externally, as an ingredient in gargles for relaxed sore throat.

(*d*) *Dose.*—3 grains to 5 grains, in pills; 2 drachms to 8 ounces of vinegar form the strength for using as a gargle diluted largely with water.

786. CARAWAY SEEDS.

(*a*) *Physical properties.*—Seeds of a warm, aromatic, and pungent taste, and a peculiar aromatic odour. Their qualities are taken up partly by water, and completely by alcohol.

(*b*) *Therapeutical effects.*—Carminative and stomachic.

(*c*) *Used* in flatulent colic, and to prevent the griping of purgatives.

(*d*) *Dose.*—5 to 15 grains.

787. CARAWAY, OIL OF, *is prepared from the above, and used for the same purposes.*

(*d*) *The dose* is 1 or 2 minims.

788. CARDAMOM SEEDS.

(*a*) *Physical properties.*—Seeds with a grateful aromatic odour, and a warm pungent taste; the active principle soluble in water and alcohol.

(*b*) *Therapeutical effects.*—Carminative, cordial, stomachic, and stimulant.

(*c*) *Used* in dyspepsia, flatulent colic of children, and to remove the griping properties of infants' aperients.

(*d*) *Dose.*—5 to 10 grains in powder.

789. CARDAMOMS, TINCTURE OF.—*The above seeds macerated in spirit of wine.*

790. CASCARILLA BARK.

(*a*) *Physical properties.*—A bark in curled pieces or short quills, which break with a resinous fracture; externally of a greyish colour, internally brownish red; odour, aromatic and agreeable; when burnt emits a smell resembling musk; taste, warm, bitter, and aromatic; yields its virtues to water in part, and completely to proof spirit.

(*b*) *Therapeutical effects.*—Stimulant, stomachic, and tonic.

(*c*) *Used* in dyspepsia, flatulent colic, chronic dysentery, and gangrene.

(*d*) *Dose.*—20 to 30 grains of this powder three or four times a day.

791. CASTOR OIL, *obtained from ricinus communis.*

(*a*) *Physical properties.*—A pale, yellow-coloured, transparent, and viscid oil, with a faint odour and nauseous taste.

(b) *Therapeutical effects.* — Mildly aperient.

(c) *Used* in colic and in those cases of constipation which will not bear drastic purgatives; also for mixing with gruel for the ordinary enema.

(d) *Dose.*—A tea-spoonful to one or two table-spoonfuls; an ounce is the proper quantity for mixing with gruel to make an enema.

792. CATECHU.—*An extract of the wood of the acacia catechu from India.*

(a) *Physical properties.*—Inodorous, sweetish, mucilaginous, astringent, and bitter; colour, dark brown; soluble in water and alcohol.

(b) *Therapeutical effects.*—Mild, unirritating, powerfully astringent, styptic.

(c) *Used* in diarrhœa and in internal hemorrhages; also, locally, as a gargle in relaxed uvula or sore throat.

(d) *Dose.*—15 to 20 grains in powder.

793. CERATE.—A species of ointment made rather hard with wax.

(A) SIMPLE CERATE.—Add 20 ounces of melted wax to a pint of olive oil, and mix while warm, stirring till cold.

(B) CERATE OF CALAMINE.—Mix seven ounces and a half of melted wax with a pint of olive oil; then remove them from the fire, and when they begin to thicken, add seven ounces and a half of calamine, and stir constantly until they cool.

(C) CERATE OF CANTHARIDES.—Mix an ounce of finely powdered cantharides with six ounces of spermaceti cerate.

(D) CERATE OF SPERMACETI.—Melt together eight ounces of white wax and ten of spermaceti; then add a pint of olive oil, and stir together till they cool.

(E) CERATE OF ACETATE OF LEAD.—Melt four ounces of white wax in eight fluid ounces of olive oil; then gradually add four drachms of powdered acetate of lead, previously rubbed with two fluid ounces of olive oil, and stir with a spatula till they unite.

(F) CERATE OF RESIN.—Mix together fifteen ounces each of resin and wax, and melt them over a slow fire; then add a pint of olive oil, and press the cerate, while hot, through a linen cloth.

(G) COMPOUND SOAP CERATE.—Boil fifteen ounces of powdered oxide of lead with a gallon of vinegar over a slow fire, constantly stirring them until they unite; then add ten ounces of soap, and boil again in a similar manner till all the moisture is evaporated; lastly, mix with them 12½ ounces of wax, previously melted in a pint of olive oil.

794. CHALK, PREPARED.—*Friable carbonate of lime, rubbed into a fine powder and washed.*

(a) *Physical properties.*—An inodorous, insipid, white, friable powder, heavy, and insoluble in water.

(b) *Therapeutical effects.*—Anti-acid, astringent, and absorbent.

(c) *Used* in acidities of the stomach and bowels, and to correct the irritation which is established in diarrhœa; externally, as a mild application to sores and burns.

(d) *Dose.*—10 to 15 grains.

795. CHAMOMILE FLOWERS.

(a) *Physical properties.*—The flowers are small, with a strong fragrant odour, and bitter aromatic taste, joined with some slight degree of warmth. Water and alcohol both absorb the virtues of this plant.

(b) *Therapeutical effects.*—Tonic, stomachic and carminative. The warm infusion, when weak, is emetic; externally soothing.

(c) *Used* in dyspepsia, hysteria, flatulence, and also to work off emetics.

(d) *Dose* of the powder—30 to 40 grains twice a day.

796. CHARCOAL, ANIMAL.—*Procured by burning bullock's blood or bones.*

(a) *Physical properties.*—A black, insipid, light powder, which removes colouring matters.

(b) *Therapeutical effects.*—Decolorant and antiseptic.

797. CHLORAL HYDRATE.

(a) *Physical properties.*—An opaque white solid, resembling a melon in smell. Soluble in water and alcohol.

(b) *Therapeutical effects.*—Sedative, anodyne, and antispasmodic, in small doses stimulant. Not followed by the ill effects of opium.

(c) Said to prevent sea-sickness. Used in neuralgia, asthma, hooping cough, &c.

(*d*) *Dose.*—From 10 to 15 or 20 grains. (See APPENDIX.)

798. CHLORIDE OF LIME.—*A combination of chlorine and lime—properly chlorinated lime.*

(*a*) *Physical properties.*—A white, semi-transparent powder; pungent bitter taste; gives out the peculiar smell of chlorine; is deliquent, and soluble in water and alcohol.

(*b*) *Therapeutical effects.*—Slightly tonic, strongly antiseptic, and destructive to noxious effluvia.

(*c*) *Used* either in powder or solution, in scrofulous swellings, and other glandular tumours, combined with bitters or alteratives; also as a disinfectant.

(*d*) *Dose.*—5 to 10 grains twice a day.

799. CHLORIDE OF ZINC.—*A combination of zinc with chlorine.*

(*a*) *Physical properties.*—In solid pieces, snow-white, inodorous; having a strongly styptic and metallic taste.

(*b*) *Therapeutical effects.*—Powerfully caustic, destroying the vitality of the part with which it is in contact, and causing very severe pain. In solution, it is used as a disinfectant, appearing to act more energetically than chlorinated soda or lime, with a less disagreeable odour of chlorine.

(*c*) *Used* as a caustic in cancer and fungoid disease; in solution, it is applied to cutaneous diseases, and to mucous membranes, but requires great caution in its use. As a disinfectant, it must be largely diluted.

800. CHLORALUM.

(*a*) *Physical properties.*—An aqueous solution of chloride of aluminum.

(*b*) *Therapeutical effects.*—A good antiseptic and disinfectant.

(*c*) *Used* for the same purposes as chloride of lime.

800*a*. CHLORODYNE.

(*a*) A patent medicine now very generally used in domestic medicine. Introduced by Dr J. Collis Browne. (See APPENDIX.)

801. CHLOROFORM.

(*a*) *Physical properties.*—A colourless fluid, with a pleasant smell, somewhat resembling peach blossoms; insoluble in water; evaporates quickly.

(*b*) *Therapeutical effects.*—Stimulant; followed by a sedative effect, rapidly produces anæsthesia.

(*c*) *Used* to relieve sickness, or in some painful conditions of the stomach, but not adapted for domestic exhibition. Externally, it relieves pain, when confined by spongio-piline, but it often blisters. Applied to a carious tooth on cotton, it gives intense pain at the moment, but afterwards affords great relief. It requires caution in its employment, to prevent inhaling its vapours to a dangerous extent.

(*d*) *Dose.*—1 to 5 minims suspended in mucilage; externally, it is applied in its usual condition.

802. CINCHONA BARK (*yellow*).

(*a*) *Physical properties.*—Larger, thicker, and less rolled than the pale bark. Externally of a brownish yellow, and internally of a cinnamon brown. The fracture is fibrous; taste bitter, and less aromatic than the pale, with scarcely any degree of astringency.

(*b*) *Therapeutical effects.*—Astringent, tonic, antiseptic, and febrifuge.

(*c*) *Used* in typhoid fevers, and in all low states of the system, being in such cases superior to quinine.

(*d*) *Dose.*—10 grains to 50, in wine or wine and water.

803. CINCHONA BARK (*pale*).

(*a*) *Physical properties.*—In pieces five or six inches long, flat, or convoluted; externally, of a grayish-brown colour, frequently covered with lichens; internally, of a bright cinnamon hue; fracture, smooth and even; powder of a yellow-orange colour; taste, bitter and astringent; odour, peculiar but aromatic.

(*b*) (*c*) (*d*) The same as the pale, but not so efficacious.

804. CINCHONA BARK (*red*).

(*a*) *Physical properties.*—Commonly in thick flat convoluted pieces, covered with a rough, entire, reddish-brown epidermis, on which lichens are often attached; fracture, short and smooth; inner structure, fibrous, and of a cinnamon colour; taste more bitter and astringent than either the yellow or pale barks.

(*b*) (*c*) (*d*) The same as the yellow and pale barks; but supposed by some to be more stomachic.

805. CINNAMON.—Bark, oil, and water, used as a warm and cordial spice to prevent the griping of purgatives, &c.

806. COCHINEAL.—*An insect dried and imported from Mexico, &c.*

(*a*) *Physical properties.*—In irregular and roundish masses, one or two lines in length; blackish red externally, purple red internally; inodorous; taste, acrid, bitter, and astringent; imparts a beautiful red colour to water and alcohol.

(*b*) *The therapeutical effects* are said to be diuretic, sudorific, and antispasmodic, but of more than doubtful efficacy.

(*c*) *Used* with carbonate of potass as a popular remedy for the hooping-cough; principally employed as a colouring agent.

(*d*) *Dose.*—$\frac{1}{4}$ to $\frac{1}{2}$ a grain, in powder

807. COD-LIVER OIL.—*Prepared from the liver of the cod-fish.*

(*a*) *Physical properties.*—An oil of three different colours: pale yellow, pale brown, and dark brown. The pale brown appears to possess the highest virtues.

(*b*) *Therapeutical effects.*—Nutritive, and acting also on the general system from containing very small doses of iodine and bromine.

(*c*) *Used* largely in consumption, in which it seems to act by keeping up the supplies rendered necessary by the waste caused by the discharge from the lungs; also in other exhausting diseases.

(*d*) *Dose.*—1 drachm carried up to 4 in any convenient vehicle, as infusion of cloves.

808. COLCHICUM.—*The root and seeds of colchicum autumnale.*

(*a*) *Physical properties.*—The *root* is the underground stem or *cormus*, about the size of a walnut, rounded on one size, flattened on the other; internally white, solid, fleshy, and succulent, with an acrid bitter taste. The *seeds* are small, spherical, and dark-brown in colour, without smell, and with a bitter acrid taste; internally white, and consisting of a minute embryo, lodged in a horny elastic envelope that is not readily powdered.

(*b*) *Therapeutical effects.*—Diuretic, sudorific, sedative, purgative, and emetic.

(*c*) *Used* in gout, rheumatism, dropsy, and in inflammatory diseases generally, in which it supersedes the necessity for bleeding; but requiring great care in its exhibition, as it depresses the system sadly, and is therefore unfit for domestic use.

(*d*) *Dose.*—3 grains to 5.

809. COLOCYNTH.—*The peeled fruit of the bitter cucumber.*

(*a*) *Physical properties.*—A white, soft, porous, medullary substance, investing the seeds; with an intensely bitter, acrid, and nauseous taste.

(*b*) *Therapeutical effects.*—Powerfully aperient.

(*c*) *Used*, with warm cordial spices, as an ordinary aperient (*see Extracts*).

810. CONFECTIONS are soft and generally sweet preparations intended to facilitate the use of remedies, by combining them in a form suitable for the stomach. The chief are as follows:—

(A) CONFECTION OF ALMONDS, intended to be kept for making almond emulsion, but scarcely required for domestic use, as the blanched almonds may at all times be readily rubbed down in the mortar with a little sugar, and the emulsion has a much more fresh and agreeable taste than if prepared from stale confections. Six or eight almonds will make half a pint of emulsion.

(B) CONFECTION, AROMATIC, is prepared by mixing a number of spices together with sugar; but as it is sold by the druggists in a much better and cheaper form than it can be prepared at home, it is useless to give the formula here. It is intended as a cordial addition to chalk mixture, &c., and is *used* in diarrhœa, hysteria, and dyspepsia; the *dose* being 10 to 20 grains.

(C) CONFECTION OF OPIUM is also sold by the druggists. It contains 1 grain of solid opium in 36, and is therefore a remedy not to be trifled with; but, at the same time, it is, perhaps, the most innocent form in which opium can be given for domestic use, especially in diarrhœa, or colicy pains. The *dose* is from 10 to 20 grains, beyond which no one should go without further medical advice.

(D) CONFECTION OF PEPPER, a strongly spiced article, prepared and sold by the druggists, and possessing carminative and stomachic powers. It is used in the dyspepsia of the aged, and in chronic internal hemorrhoids. The *dose* being ½ drachm to 1 drachm.

(E) CONFECTION OF ROSES, employed as a useful form for making up pills; its properties being said to be slightly astringent and tonic, but not so as to be appreciated easily.

(F) CONFECTION OF SENNA, is a preparation of senna leaves, powdered and mixed with coriander seeds, liquorice, figs, tamarinds, prunes, and sugar. It is mildly laxative, and *used* in habitual costiveness, and for hemorrhoids; the *dose* being 1 drachm to 2 or 3.

811. CONIUM (*Hemlock*).—*The leaves of conium maculatum, an indigenous plant.*

(*a*) *Physical properties.*—Has a heavy narcotic smell, with a bitter, nauseous, and herbaceous taste; colour, dull green; powers soon destroyed by light. Should be gathered just as the plant comes into flower, and dried in the sun, or in a stove.

(*b*) *Therapeutical effects.*—Sedative, narcotic; in some cases alterative, and even tonic.

(*c*) *Used* in scirrhous and cancerous affections externally, and internally for neuralgia and pulmonary complaints; also in the scrofulous complaints of children, especially in opthalmia; in all cases requiring great caution; externally as a poultice, made by scalding the fresh leaves.

(*d*) *Dose.*—2 to 3 or 4 grains.

812. COPAIBA BALSAM.

(*a*) *Physical properties.*—A liquid of a transparent yellowish colour, and peculiar smell and taste, which is pungent, acrid, and nauseous; when fresh, of the consistence of linseed oil, gradually becoming thicker by exposure to the air, till at last it is as solid as resin; soluble in ether and alcohol.

(*b*) *Therapeutical effects.*—Stimulant, diuretic, purgative in large doses; allays irritation of the mucous membranes, and especially those of the urinary passages.

(*c*) *Used* in chronic bronchitis, spasmodic asthma, hooping-cough, and in chronic inflammations of the bladder, &c.

(*d*) *Dose.*—10 minims to 30 in emulsion, or in the gelatine capsules in which it is sold.

813. COPPER, SULPHATE OF.—*Blue stone. A union of sulphuric acid with copper.*

(*a*) *Physical properties.*—Bright blue crystals, efflorescent; taste, metallic and styptic; soluble in twice its weight of water at 60 degrees.

(*b*) *Therapeutical effects.*—Tonic, astringent, antispasmodic, emetic, and caustic.

(*c*) *Used* internally in diarrhœa, epilepsy, hysteria; externally, dissolved in water, as a collyrium in opthalmia, to old indolent ulcers; and in its solid state as a mild caustic.

(*d*) *Dose.*—This should never be administered internally without medical advice; externally, it may be useful.

814. CORIANDER SEEDS *are used largely as a warm kind of spice.*

(*a*) *Physical properties.*—Globular, slightly striated, of a yellowish-brown colour, and agreeable odour. The taste is sweetish, but somewhat acrid and aromatic.

(*b*) *Therapeutical effects.*—Stimulating, stomachic, and carminative.

(*c*) *Used* principally to cover the taste of other medicines, and to prevent their irritating effects.

(*d*) *Dose.*—15 grains to 30.

815. CREASOTE.—*A peculiar liquid prepared from pyroxylic oil.*

(*a*) *Physical properties.*—An oily, colourless, transparent fluid; with a disagreeable smell, resembling somewhat the odour of badly-smoked meat. It burns with a smoky flame. With water at 68 degrees, it combines in two distinct and separate portions; one stronger than the other, so as to require agitation immediately before use.

(*b*) *Therapeutical effects.*—Tonic, stomachic, diaphoretic, antiseptic, and styptic.

(c) *Used* internally in phthisis; also in troublesome vomiting, from any cause not readily understood, as seasickness, or that occurring in pregnancy. Externally, to carious teeth, malignant sores, and cutaneous eruptions.

(d) *Dose.*—1 to 4 minims in alcohol and water, two or three times a day; or made into a pill with crumb of bread.

816. DECOCTION.—A preparation of vegetable substances by boiling in water, and straining off the fluid for present use.

(A) DECOCTION OF ALOES (*compound*).

(a) Boil 7 drachms of liquorice, 1 drachm of carbonate of potass, 1½ drachm of socotrine aloes, 1½ drachm of bruised myrrh, and the same quantity of saffron, in 1½ pint of distilled water, down to a pint, and strain: then add 7 fluid ounces of compound tincture of cardamom.

(b) *Therapeutical effects.*—Stomachic, stimulant, aperient; acting chiefly on the lower bowels. (See ALOES.)

(c) *Used* in dyspepsia, habitual constipation, jaundice, &c.

(d) *Dose.*—½ ounce to 1 ounce.

(B) DECOCTION OF BARLEY (*barley water.*)

(a) Wash 2½ ounces of pearl barley; then boil them in half a pint of water for a short time. Throw this water away, and pour on the barley 4 pints of hot water; boil *slowly* down to 2 pints, and strain.

(b) *Therapeutical effects.*—Soothing and nourishing.

(c) *Used* as a diluent drink in fevers, and in inflammation of mucous surfaces, especially those of the urinary organs.

(C) DECOCTION OF BARLEY (*compound*).

(a) Boil 2 pints of barley water (see par. B) with 2½ ounces of sliced figs, 4 drachms of bruised fresh liquorice, 2½ ounces of raisins, and a pint of water, down to 2 pints, and strain.

(b) (c) The same as the last, but, in addition, laxative.

(D) DECOCTION OF BROOM (*compound*).

(a) Take ½ an ounce of broom, ½ an ounce of juniper berries, and ½ an ounce of bruised dandelion, boil in a pint and a half of water down to a pint, and strain.

(b) *Therapeutical effects.*—Diuretic, and slightly aperient.

(c) *Used* in dropsy.

(d) *Dose.*—1½ ounce to 2 ounces, twice or thrice a day.

(E) DECOCTION OF CINCHONA (*yellow, pale, or red.*

(a) Boil 10 drachms of bruised yellow, pale, or red cinchona in a pint of water for ten minutes, in a closed vessel; then strain.

(b) *Therapeutical effects.*—Antiseptic, astringent, tonic, febrifuge.

(c) *Used* in fever, malignant sore throat, dyspepsia.

(d) *Dose.*—1½ to 3 ounces twice or thrice a day.

(F) DECOCTION OF DANDELION.

(a) Boil 4 ounces of bruised dandelion in 1½ pint of distilled water to a pint, and strain.

(b) *Therapeutical effects.*—Diuretic, slightly aperient, and specially acting on the liver.

(c) *Used* in torpid conditions of the liver, jaundice, habitual constipation, &c.

(d) *Dose.*—2 or 3 ounces twice or thrice a day.

(G) DECOCTION OF DULCAMARA.—(*Woody-nightshade*).

(a) Boil ten drachms of dulcamara in a pint and a half of water down to a pint, and strain.

(b) *Therapeutical effects.*—Diuretic and diaphoretic.

(c) *Used* in dropsy and cutaneous diseases.

(d) *Dose.*—½ ounce to 1 ounce two or three times a day.

(H) DECOCTION OF ICELAND MOSS.

(a) Boil 5 drachms of Iceland moss in a pint and a half of water down to a pint, and strain.

(b) *Therapeutical effects.* — Tonic, emollient, slightly astringent.

(c) *Used* in consumption and dysentery.

(d) *Dose.*—1 to 2 ounces.

(I) DECOCTION OF LOGWOOD.

(a) Boil 10 drachms of sliced logwood in 1½ pint of water to a pint, and strain.

(*b*) *Therapeutical effects.*—Astringent and tonic.

(*c*) *Used* in diarrhœa and dysentery.

(*d*) *Dose.*—1 ounce to 2 ounces after each action of the bowels.

(J) DECOCTION OF OAK BARK.

(*a*) Boil 10 drachms of oak bark bruised in 2 pints of water down to a pint, and strain.

(*b*) *Therapeutical effects.*—Astringent.

(*c*) *Used* as an injection in prolapse of the anus, and other relaxed conditions of mucous membranes.

(K) DECOCTION OF POPPY-HEADS.

(*a*) Boil 5 ounces of bruised poppyheads in 5 pints of water for a quarter of an hour, and strain.

(*b*) *Therapeutical effects.*—Anodyne and soothing.

(*c*) *Used* as a fomentation in painful swellings and inflammations.

(L) DECOCTION OF QUINCE SEEDS.

(*a*) Boil two drachms of quince seeds in a pint of water, in a tightly covered vessel, for ten minutes, and strain.

(*b*) *Therapeutical effects.*—Demulcent.

(*c*) *Used* in thrush, and irritable conditions of the mucous membrane.

(M) DECOCTION OF SARSAPARILLA (*simple*).

(*a*) Boil 5 ounces of sarsaparilla in 4 pints of water to 2 pints, and strain.

(*b*) *Therapeutical effects.*—Alterative, diaphoretic, and tonic.

(*c*) *Used* in cutaneous diseases, chronic rheumatism, and scrofula.

(*d*) *Dose.*—2 ounces, twice or thrice a day.

(N) DECOCTION OF SARSAPARILLA (*compound*).

(*a*) Mix 4 pints of boiling decoction of sarsaparilla, 10 drachms of sliced sassafras, 10 drachms of guaiacum-wood shavings, 10 drachms of bruised stick-liquorice, and 3 drachms of mezereon-bark; boil for a quarter of an hour, and strain.

(*b*) (*c*) (*d*) *Therapeutical effects.*—The same as the last, but warmer, and therefore better suited to weak stomachs.

(O) DECOCTION OF STARCH.

(*a*) Rub 4 drachms of starch with a pint of water gradually added, then boil for a short time, till it thickens.

(*b*) *Therapeutical effects.*—Soothing.

(*c*) *Used* chiefly as a clyster in diarrhœa or dysentery, with the addition of opium in some form.

817. DIGITALIS.—A medicine in no case fit for domestic use, being a very powerful sedative, and cumulative in its effects, so that a dozen small doses repeated at intervals will act as strongly as if all had been given at once.

818. DILL WATER.—*Prepared from dill seeds by distillation.*

(*a*) *Physical properties.*—An aromatic odour, with a pungent agreeable taste.

(*b*) *Therapeutical effects.*—Carminative and stimulant.

(*c*) *Used* in the flatulence and gripings of children.

(*d*) *Dose.*—½ drachm to ½ ounce.

819. DULCAMARA, *Woody-nightshade. (See Decoction of.)*

820. ELATERIUM.—*A powerful cathartic, and entirely unfit for domestic use.*

821. EXTRACT.—A vegetable decoction boiled down till the water is nearly all evaporated. Very useful for making pills.

(A) EXTRACT OF COLOCYNTH.

(*a*) (*b*) (*c*) (See COLOCYNTH.)

(*d*) *Dose.*—5 to 10 grains.

(B) EXTRACT OF DANDELION.—*Prepared from the decoction of dandelion, and used for the same purposes.*

(*d*) *Dose.*—I scruple to 1 drachm.

(C) EXTRACT OF GENTIAN.

(*a*) Made from the gentian root.

(*b*) *Therapeutical effects.*—Tonic and stomachic.

(*c*) *Used* in dyspepsia.

(*d*) *Dose.*—5 to 20 grains.

(D) EXTRACT OF HENBANE.—*Prepared from the leaves of hyoscyamus niger.*

(*a*) *Physical properties.*—An extract of a dingy olive colour, and a peculiar, disagreeable smell; taste, bitterish and saline.

(*b*) *Therapeutical effects.*—Narcotic, anodyne, and antispasmodic.

(*c*) *Used* instead of opium, in irritability of the nervous system, or mucous surfaces, or in combination with purgatives to prevent their griping, as it does not cause constipation.

(*d*) *Dose.*—5 to 8 grains.

(E) EXTRACT OF HOP.

(*a*) *Physical properties.*—A dark-coloured bitter extract, without much smell.

(*b*) *Therapeutical effects.*—Tonic and sedative.

(*c*) *Used* in chronic dyspepsia and loss of sleep.

(*d*) *Dose.*—10 to 15 grains.

(F) EXTRACT OF LETTUCE.

(*a*) *Physical properties.*—An extract of a dark brown colour, and narcotic odour; taste, bitter.

(*b*) *Therapeutical effects.*—Narcotic and diaphoretic.

(*c*) *Used* instead of opium, but not of any great service, as it is very uncertain in its operation.

(*d*) *Dose.*—5 grains to 10.

(G) EXTRACT OF SARSAPARILLA (*liquid*).—*Prepared from sarsaparilla, and used for the same purposes as the decoction. It is sold both as a simple and compound extract.*

(*d*) *Dose.*—30 drops to 1 drachm two or three times a day in water.

822. GALLS.—*Produced on the young branches of the gall-oak, from the puncture of the ovipositor of a small insect.*

(*a*) *Physical properties.*—Two kinds are sold, one of which is inferior in quality, being of a blackish-blue or deep olive colour, with unequal warty surface; astringent bitter taste, and hard to break. The other kind is of a whitish colour, smooth surface, very austere bitter taste, being easily broken, less compact, and of larger size.

(*b*) *Therapeutical effects.*—Astringent and tonic.

(*c*) *Used* in protracted diarrhœa and intestinal hemorrhage; also in relaxed conditions of the fauces and rectum; as a local application.

(*d*) *Dose.*—10 grains to 20, with aromatics, thrice a day. An infusion may be used for relaxation of the fauces, &c. An ointment is prepared by mixing 1 drachm of the powder with 1 ounce of lard; but that made with gallic acid is superior to it.

823. GAMBOGE.—*A gum resin, of a purgative nature, but too powerful for domestic use.*

824. GENTIAN ROOT.

(*a*) *Physical properties.*—A root usually sold in slices; inodorous; intensely bitter; externally brown, twisted, and wrinkled; internally yellow, spongy, and flexible; properties readily imparted to wine, spirit, or water.

(*b*) *Therapeutical effects.*—Tonic and stomachic.

(*c*) *Used* in dyspepsia and general want of tone.

(*d*) *Dose.*—10 grains to 20.

825. GUAIACUM WOOD AND RESIN.

(*a*) *Physical properties.* The wood is hard and ponderous; dark olive brown within; whitish towards the bark; peculiar acid aromatic scent; taste, warm and bitter. The resin exudes spontaneously from the tree; is semi-transparent, of a greenish colour; breaks with a vitreous fracture; nearly tasteless at first, but soon producing a burning sensation in the throat; melts when heated, at the same time emitting a pretty strong odour.

(*b*) *Therapeutical effects.*—Stimulant, diaphoretic, and purgative.

(*c*) *Used* in chronic rheumatism and cutaneous diseases.

(*d*) *Dose.*—10 grains to 20 in pills, or to make an emulsion.

826. HORSE-RADISH (*the fresh root*).

(*a*) *Physical properties.*—Pungent odour; biting, acrid taste; communicates its active principles partially to water, but completely to alcohol.

(*b*) *Therapeutical effects.*—Stimulant, diuretic, sudorific, emetic.

(*c*) *Used* in paralytic affections and chronic rheumatism.

(*d*) *Dose.*—1 to 2 drachms, cut into small pieces, or made into an infusion (see par. G.)

827. ICELAND MOSS.

(*a*) *Physical properties.*—Inodorous, mucilaginous, tough, bitter.

(*b*) *Therapeutical effects.*—Demulcent, tonic, and nourishing.

(*c*) *Used* in the preparation of the decoction.

828. INFUSION.—A preparation by steeping in boiling water, and after a time straining.

(A) INFUSION OF BUCHU.

(*a*) Macerate an ounce of buchu in a pint of boiling water for four hours, in a covered vessel, and strain.

(b) (c) The same as buchu (par. 778).

(d) *Dose.*—1 ounce to 2 ounces three or four times a day.

(B) INFUSION OF CALUMBA.

(a) (b) (c) (d) The same as chamomile, which see (par. 795).

(C) INFUSION OF CASCARILLA.

(a) Macerate 1½ ounce of bruised cascarilla in a pint of boiling water for two hours, in a covered vessel, and strain.

(b) *Therapeutical effects.*—Stomachic and tonic.

(c) *Used* in dyspepsia, diarrhœa, and general debility.

(d) *Dose.*—1 ounce to 2.

(D) INFUSION OF CHAMOMILE. — *Chamomile tea.*

(a) Macerate five drachms of chamomile flowers in a pint of boiling distilled water for ten minutes, in a closed vessel, and strain.

(b) *Therapeutical effects.*—Tonic, stomachic; emetic, when warm; externally soothing.

(c) *Used* in dyspepsia, and to assist the operation of emetics.

(d) *Dose.*—1 to 2 ounces. For emetic purposes, a weaker infusion is used in large quantities.

(E) INFUSION OF CLOVES.

(a) Macerate 3 drachms of bruised cloves in a pint of boiling water, in a covered vessel, and strain.

(b) *Therapeutical effects.*—Stimulant, stomachic, slightly tonic.

(c) *Used* as a vehicle for more active tonics, especially cod-liver oil.

(d) *Dose.*—1 ounce to 2 or 3.

(F) INFUSION OF GENTIAN (*compound*).

(a) Macerate 2 drachms of sliced gentian, 2 drachms of dried orange-peel, and 4 drachms of lemon-peel, in a pint of boiling water for an hour, in a covered vessel, and strain.

(b) *Therapeutical effects.*—Stomachic and tonic.

(c) *Used* in dyspepsia and general debility.

(d) *Dose.*—1½ to 2 ounces two or three times a day.

(G) INFUSION OF HORSE-RADISH (*compound*).

(a) Macerate an ounce of horse-radish, sliced, and an ounce of bruised mustard-seed in a pint of boiling water for two hours, in a covered vessel, and strain. Then add a fluid once of the compound spirit of horse-radish.

(b) (c) The same as in par. 826.

(d) *Dose.*—1 to 3 ounces three or four times a day.

(H) INFUSION OF LINSEED (*compound*). —*Linseed tea.*

(a) Macerate six drachms of bruised linseed and ten drachms of sliced fresh liquorice, in a pint of boiling water, for four hours, near the fire in a covered vessel, and strain.

(b) *Therapeutical effects.*—Soothing, especially to the mucous passages.

(c) *Used* in chronic bronchitis and strangury.

(d) *Dose.—Ad libitum.*

(I) INFUSION OF ORANGE PEEL (*compound*).

(a) Macerate half an ounce of dried orange peel, two drachms of lemon peel, one drachm of cloves, bruised, in a pint of boiling water, for a quarter of an hour, in a covered vessel, and strain.

(b) *Therapeutical effects.*—Stimulant, stomachic, and tonic.

(c) *Used* in dyspepsia, and as a vehicle for other remedies.

(d) *Dose.*—One ounce to two or three, at short intervals.

(J) INFUSION OF QUASSIA.

(a) Macerate ten scruples of quassia sliced, in a pint of boiling water, for two hours, in a covered vessel.

(b) *Therapeutical effects.*—Tonic and stomachic.

(c) *Used* in dyspepsia.

(d) *Dose.*—1½ to 2 ounces.

(K) INFUSION OF RHUBARB.

(a) Macerate 3 drachms of sliced rhubarb root in a pint of boiling water for two hours, in a covered vessel, and strain.

(b) *Therapeutical effects.*—Stomachic, tonic, and aperient.

(c) *Used* in dyspepsia accompanied with constipation, especially in combination with gentian.

(d) *Dose.*—½ ounce to 1½ ounce.

(L) INFUSION OF ROSES (*compound*).

(a) Put 3 drachms of the dried red rose leaves into a pint of boiling water then add a fluid drachm and a half of diluted sulphuric acid. Macerate for two hours and strain the liquor; lastly, add six drachms of sugar.

(*b*) *Therapeutical effects.*—Astringent, refrigerant, and antiseptic.

(*c*) *Used* as a drink in fevers; also as a vehicle for sulphate of magnesia, quinine, &c.

(*d*) *Dose.*—1½ to 2 ounces.

(M) INFUSION OF SENNA (*compound*). —*Senna tea.*

(*a*) Macerate 15 drachms of senna leaves, and 4 scruples of bruised ginger, in a pint of boiling water for an hour, in a closed vessel, and strain.

(*b*) *Therapeutical effects.*—Aperient.

(*c*) *Used* as a vehicle for more active purgatives, which it assists; or by itself as a mild purgative.

(*d*) *Dose.*—1 to 3 ounces.

(N) INFUSION OF VALERIAN.

(*a*) Macerate half an ounce of valerian in a pint of boilng water for half an hour, in a closed vessel, then strain.

(*b*) *Therapeutical effects.*—Antispasmodic and tonic.

(*c*) *Used* in hysteria.

(*d*) *Dose*—1½ to 2 ounces.

829. IODINE.

(*a*) *Physical properties.*—A material of a solid, opaque, bluish-black colour, semi-metallic lustre; pungent odour, similar to chlorine; acrid taste. It stains the skin of a yellowish-brown colour, destroys vegetable colours; with starch, strikes a blue colour; is sparingly soluble in water; soluble in rectified spirit.

(*b*) *Therapeutical effects.*—Stimulant, exercising a peculiar effect in producing absorption of unnatural growths.

(*c*) *Used* in enlarged glands, and generally in chronic enlargements of other bodies.

(*d*) *Dose.*—It is not fit for domestic use in this form, nor indeed in any other.

830. IODIDE OF POTASSIUM. (See POTASSIUM, IODIDE OF.)

831. IPECACUANHA (*the root*).

(*a*) *Physical Properties.*—In pieces of three or four inches in length, with a resinous fracture; an acrid, aromatic, and somewhat bitter taste; slightly nauseous; peculiar odour; yields its active principle to water, spirit, and wine.

(*b*) *Therapeutical effects.*—Emetic, diaphoretic, expectorant, and acting peculiarly on the liver.

(*c*) *Used* as an emetic; also as an expectorant in bronchitis, asthma, &c.; as a nauseate in pneumonia, diarrhœa, dysentery; as a diaphoretic in various diseases; and in torpid liver, to promote its proper secretions.

(*d*) *Dose.*—As an emetic, 15 to 30 grains; as a nauseate, 2 to 4 grains; as a diaphoretic, 1 grain, with a small dose of opium; as an expectorant, or for torpid liver, ½ to 1 grain.

832. IRON OR STEEL.—The metal combined with various acids, and also with oxygen in the form of oxyde. The most usual forms are the carbonate, sulphate, citrate, and iodide.

833. JALAP (*the root*).

(*a*) *Physical properties.*—Thin transverse slices, or round masses; solid, hard, and heavy; dark-gray colour; striated appearance; sickly smell; taste sweetish, but nauseous.

(*b*) *Therapeutical effects.*—Actively aperient and diuretic; generally producing nausea.

(*c*) *Used* in obstinate constipation, worms, dropsy; requires a carminative to prevent griping and nausea

(*d*) *Dose.*—10 grains to 30.

834. LARD *is used externally in the preparation of ointments, caustics, &c.*

835. LEMON-PEEL (*juice and essence*).

(*a*) Produced from the lemons as imported.

(*b*) *Therapeutical effects.*—The *peel* is aromatic, stomachic, and slightly tonic. The *essence* is stimulant. The *juice* is antiscorbutic, antiseptic, tonic, and diaphoretic, in large quantities.

(*c*) The juice is *used* with great success in gout and rheumatism. With soda and potass it forms the ordinary effervescing draught. (See SODA, CARBONATE OF.)

(*d*) *Dose* of the juice for gout, &c. Half an ounce every two or three hours on an empty stomach.

836. LINIMENT.—A stimulating external application, intended to be rubbed in.

(A) LINIMENT OF AMMONIA.—*Hartshorn and oil.*

(*a*) To 1 fluid ounce of the solution

of ammonia, add 2 fluid ounces of olive oil, and shake together.

(*b*) *Therapeutical effects.*—Stimulant and rubefacient.

(*c*) *Used* in sore throat externally, and chronic rheumatism with friction.

(B) LINIMENT OF CAMPHOR.

(*a*) Dissolve 1 ounce of camphor in 4 fluid ounces of olive oil.

(*b*) *Therapeutical effects.*—Stimulant.

(*c*) *Used* in chronic rheumatism with friction.

(C) LINIMENT OF CAMPHOR (*compound*).

(*a*) Dissolve 2½ ounces of camphor and 1 drachm of oil of lavender in 17 fluid ounces of rectified spirits of wine; then add 3 fluid ounces of the strong solution of ammonia, and shake well together.

(*b*) *Therapeutical effects.*—Stimulant.

(*c*) *Used* with friction, in the same way as the simple liniment, but it is more powerful.

(D) LINIMENT OF OPIUM.—*Sold ready prepared.*

(*b*) *Therapeutical effects.*—Anodyne.

(*c*) *Used* in local pains, and to bruises.

(E) LINIMENT OF SOAP.—*Sold ready prepared by the druggists.*

(*b*) *Therapeutical effects.*—Stimulant.

(*c*) *Used* in chronic rheumatism and neuralgia; and as a vehicle for other more active rubefacients.

(F) LINIMENT OF TURPENTINE.

(*a*) Shake well together 2 ounces of soft soap, and an ounce of camphor, with 16 fluid ounces of the spirit of turpentine, until mixed.

(*b*) *Therapeutical effects.*—Stimulant.

(*c*) *Used* in paralytic affections and chronic rheumatism; also to burns and scalds.

837. LIQUOR.—A solution intended to be kept ready prepared for use.

(A) LIQUOR OF ACETATE OF AMMONIA.

(*a*) Add as much sesquicarbonate of ammonia to diluted acetic acid (*distilled vinegar*) as will saturate it, which is evidenced by the cessation of the effervescence.

(*b*) *Therapeutical effects.*—Diaphoretic, cooling, and diuretic.

(*c*) *Used* in all febrile conditions.

(*d*) *Dose.*—2 to 4 drachms.

(B) LIQUOR OF ACETATE OF LEAD.

(*a*) Sold by the druggists.

(*b*) *Therapeutical effects.*—Sedative and astringent when applied externally.

(*c*) *Used* as a lotion to inflamed surfaces when largely diluted with water. Goulard water is prepared from it by adding a fluid drachm and a half of it and 2 fluid drachms of proof spirit to a pint of distilled water.

(C) LIQUOR OF POTASS.

(*a*) *Physical properties.*—A colourless fluid; inodorous; taste acrid and caustic; feels soapy between the fingers.

(*b*) *Therapeutical effects.*—Anti-acid, diuretic, alterative, soothing to the mucous membranes when diluted.

(*c*) *Used* in acidity of the stomach and bowels; also in irritability of the stomach and of the bladder; and in cutaneous diseases.

(*d*) *Dose.*—10 drops to 30 in beer or bitter infusion.

838. MAGNESIA, CARBONATE OF.

(*a*) *Physical properties.*—A solid, white, tasteless, inodorous powder, insoluble in water.

(*b*) *Therapeutical effects.*—Anti-acid and purgative.

(*c*) *Used* in dyspepsia with costiveness, in the constipation of children and delicate grown persons.

(*d*) *Dose.*—½ drachm to 1 drachm or 2. The solution is used very extensively, as prepared by Sir John Murray and Mr. Dinneford, with an excess of carbonic acid to hold the magnesia in solution. The dose is 1 drachm to ½ ounce or 1 ounce.

839. MAGNESIA, SULPHATE OF.—*Epsom salts.*

(*a*) *Physical properties.*—Small pointed crystals, of a transparent, colourless appearance; inodorous, with a disagreeable bitter taste; dissolves readily in water.

(*b*) *Therapeutical effects.*—Purgative.

(*c*) *Used* as a cooling laxative, washing the bowels out, but not searching them.

(*d*) *Dose.*—1 drachm to 1 ounce.

840. MANNA.

(*a*) *Physical properties.*—A pale yellowish white colour, and crystalline appearance; taste, sweet but sickly;

odour, slightly disagreeable. Soluble in water and alcohol.

(*b*) *Therapeutical effects.* — Mildly aperient.

(*c*) *Used* principally for infants, or to sweeten aperient draughts.

(*d*) *Dose.*—2 ounces for adults, 1 to 4 drachms for infants.

841. Marsh Mallows.

(*a*) *Physical properties.* — A root, long cylindrical; grayish without, white within; inodorous; taste, sweetish.

(*b*) *Therapeutical effects.*—Soothing.

(*c*) *Used* to make a soothing drink in irritation of the mucous membranes, or as a fomentation, boiling the leaves and root to form it.

842. Mercury, *and its preparations.*—The pure metal is not used in medicine, except for the purpose of making the amalgam with silver introduced into decayed teeth.

(A) Mercury, Ammonio-chloride of.—*White precipitate.*

(*a*) *Physical properties.*—A white inodorous powder; insipid; insoluble in water and alcohol.

(*b*) *Therapeutical effects.*—Used externally only; it is detergent.

(*c*) *Used* for cutaneous diseases, and for destroying lice, &c., in its powdered condition.

(B) Mercury, Bichloride of.—*Corrosive sublimate.*

(*a*) Too powerful for domestic use, except for the purpose of destroying vermin.

(C) Mercury, Chloride of.—*Calomel.*

(*a*) *Physical properties.*—A white semi-transparent crystalline mass, inodorous, insipid, and insoluble; usually sold as a heavy white powder.

(*b*) *Therapeutical effects.*—Alterative, purgative, and producing absorption.

(*c*) *Used* in chronic diseases of the liver and general torpidity of the stomach and bowels; in dropsy, in combination with other medicines. A most dangerous medicine when employed by those who are not aware of its powerful effects.

(*d*) *Dose.*—1 grain twice a day as an alterative, 4 to 5 grains as an aperient, combined with, or followed by, some mild vegetable purgative.

(D) Mercury, Green and Red Iodide of.

Two strong and very powerful agents in effecting absorption; not adapted for domestic use, except externally.

(E) Mercury, Nitric-Oxide of.—*Red precipitate.*

(*a*) *Physical properties.*—A powder of a brilliant red colour, insoluble in water.

(*b*) *Therapeutical effects.*—Stimulant externally.

(*c*) *Used* to old ulcers, and to heal indolent sores of all kinds, when made into an ointment with lard. (See Ointments.)

(F) Mercury, with Chalk.—*Gray powder.*

(*a*) *Physical properties.* — A heavy bluish-gray powder, insoluble in water.

(*b*) *Therapeutical effects.*—Anti-acid, alterative, mildly laxative, and stimulating to the action of the liver.

(*c*) *Used* as a mild alterative and stimulant to the liver in children.

(*d*) *Dose.*—5 grains to 15 in the adult.

843. Mint-water.—*Prepared from pepper-mint* or *spear-mint.*

(*a*) These are sold in the shops.

(*b*) *Therapeutical effects.* Both are carminative and slightly stimulating. Spear-mint water is also diuretic.

(*c*) *Used* as a vehicle for other remedies.

844. Mixture. — A solution generally made at the time when it is to be used, and not kept ready prepared.

(A) Mixture of Acacia.—*Mucilage.*

(*a*) Rub 10 ounces of bruised acacia gum with a pint of boiling water, gradually poured on until dissolved.

(*b*) *Therapeutical effects.*—Soothing.

(*c*) *Used* to allay irritation of mucous membranes, as in bronchitis and inflammation of the bladder; also to suspend insoluble substances.

(*d*) *Dose.*—1 drachm to ½ ounce.

(B) Mixture of Almonds.—*Emulsion of almonds, prepared from the confection or from fresh almonds.* (See Almonds.)

(C) Mixture of Ammoniacum.

(*a*) Rub 5 drachms of gum-ammoniacum with a pint of distilled water, gradually added until properly mixed.

(*b*) *Therapeutical effects.*—Stimulant, antispasmodic, expectorant.

(c) *Used* in chronic bronchitis, especially in old people, and asthma.

(d) *Dose.*—½ ounce to 1 ounce.

(D) MIXTURE OF CAMPHOR.—*Camphor mixture.*

(a) Rub half a drachm of camphor with ten minims of rectified spirit; then add gradually a pint of distilled water, and strain through linen.

(b) *Therapeutical effects.*—Stimulating, antispasmodic, diaphoretic.

(c) *Used* as a vehicle for other remedies.

(d) *Dose.*—1 or 1½ ounce.

(E) MIXTURE OF CHALK.

(a) Rub ½ ounce of prepared chalk and 3 drachms of sugar with 1½ fluid ounce of mixture of acacia, and 8 fluid ounces of cinnamon water.

(b) *Therapeutical effects.*—Anti-acid, absorbent, and astringent when given in diarrhœa.

(c) *Used* in diarrhœa, especially when united with aromatic confection and opium, or catechu.

(F) MIXTURE OF GUAIACUM.

(a) Rub 3 drachms of powdered guaiacum with half an ounce of sugar, and two drachms of powdered acacia; to these, while rubbing, add gradually a pint of cinnamon water.

(b) *Therapeutical effects.*—Stimulant and diaphoretic.

(c) *Used* in chronic rheumatism.

(d) *Dose.*—1 to 1½ ounce.

(G) MIXTURE OF IRON (*compound*).

(a) Rub 2 drachms of powdered myrrh and 1 drachm of carbonate of potass with a fluid ounce of spirit of nutmeg; to these, while rubbing, add 18 fluid ounces of rose-water, 2 drachms of sugar, and 2½ scruples of powdered sulphate of iron. Put the mixture in a well-stoppered bottle.

(b) *Therapeutical effects.*—Stomachic, astringent, tonic, emmenagogue.

(c) *Used* in chlorotic girls, and also in all defective secretions of young females.

(d) *Dose.*—1 to 1½ ounce.

845. MYRRH (*the gum-resin, usually powdered*).

(a) *Physical properties.*—A powder of a yellowish-brown colour; an agreeable, peculiar odour; bitter and slightly aromatic taste; partially soluble in water; alcohol dissolves its resin; soluble in alkalies.

(b) *Therapeutical effects.*—Tonic, stimulant, expectorant, emmenagogue.

(c) *Used* chiefly with steel, internally; externally, as an ingredient in tooth-powder.

(d) *Dose.*—2 or 3 grains.

846. OINTMENT.—A greasy vehicle for medicinal substances, intended to be applied to the skin.

(A) OINTMENT OF CREASOTE.

(a) Rub half a fluid drachm of creasote with an ounce of lard, until they are incorporated.

(b) *Therapeutical effects.*—Stimulant.

(c) *Used* in scald heads, &c.

(B) OINTMENT OF GALLS (*compound*).

(a) Mix 6 drachms of finely powdered galls, 6 ounces of lard, and 1½ drachm of powdered opium.

(b) Astringent and anodyne.

(c) *Used* for hemorrhoids; but one quarter of the quantity of gallic acid answers much better.

(C) OINTMENT OF GREEN IODIDE OF MERCURY.

(a) Mix 1 drachm of green iodide of mercury with 1 ounce of lard.

(b) *Used* in scald-head, for which it is very efficacious.

(D) OINTMENT OF IODIDE OF POTASSIUM.

(a) Dissolve 2 drachms of iodide of potassium in 2 fluid drachms of boiling distilled water, then mix with 10 ounces of lard.

(b) Stimulant, and producing absorption of glandular swellings, such as wens, &c.

(E) OINTMENT OF NITRATE OF MERCURY.

(b) *Therapeutical effects.*—Stimulant.

(c) *Used* when diluted with spermaceti ointment in cutaneous diseases, and for the lids in weak eyes.

(F) OINTMENT OF NITRIC OXIDE OF MERCURY.

(a) Rub 1 ounce of finely powdered nitric oxide of mercury with 10 ounces of wax, and 6 ounces of lard.

(b) *Therapeutical effects.*—Stimulant.

(c) *Used* to indolent ulcers.

(G) OINTMENT OF SAVINE.

(a) Melt 3 ounces of white wax, with

a pound of lard, and mix half a pound of bruised fresh savine, then express through linen.

(c) *Used* for dressing blisters to keep them open.

(H) OINTMENT OF SULPHUR (*compound*).

(a) Made of sulphur, white hellebore, and ointment of potass, with soft soap and lard.

(b) *Used* in itch.

(I) OINTMENT OF ZINC.

(a) Mix 1 drachm of oxide of zinc with 6 drachms of lard.

(b) *Used* as a cooling, astringent, and drying ointment.

847. OLIVE OIL.

(a) *Physical properties.*—A transparent fixed oil, of a yellowish colour, inodorous, and without much taste; boils at 600 degrees Fahrenheit; congeals at 38 degrees.

(b) *Therapeutical effects.*—Soothing, and slightly aperient.

(c) *Used* in bronchial irritation; also as a vehicle for other medicines in the form of liniment.

(d) *Dose.*—1 to 2 drachms.

848. OPIUM.—*The inspissated juice of the papaver somniferum.*

(a) *Physical properties.* — *Turkey opium* is in flat, compact, dry, heavy cakes, of a deep brown colour, with a light fracture; taste nauseous, bitter, and pungent; odour peculiar and unpleasant. *India opium* is less consistent and more ductile. It is partly soluble in both water and alcohol, and very easily dissolved in vinegar and oil.

(b) *Therapeutical effects.*—Anodyne, antispasmodic, diaphoretic, and narcotic.

(c) *Used* in painful affections unaccompanied by fever, in diarrhœa, and all mucous irritations, but requiring great care, and scarcely fit for home use.

(d) *Dose.*—$\frac{1}{4}$ to 1 grain.

849. OXYMEL OF SQUILL.—*Vinegar of squills, sweetened with honey.*

(a) (b) (c) The same as squill.

(d) *Dose.*—1 to $1\frac{1}{2}$ drachm.

850. PELLITORY OF SPAIN.

(a) *Physical properties.*—A root possessing a sharp acrid taste, leaving a burning sensation in the mouth.

(b) *Therapeutical effects.*—Stimulant, sialogogue.

(c) *Used* to fill decayed teeth in tooth-ache.

851. PERUVIAN BALSAM.

(a) *Physical properties.*—Of the consistence of honey; colour, brown; an agreeable smell, and hot acrid taste.

(b) *Therapeutical effects.*—Stimulant, expectorant; externally applied to indolent ulcers.

(c) *Used* in catarrh and chronic rheumatism.

(d) *Dose.*—15 minims to half a drachm.

852. PILL.—A substance intended to be made up into small round balls for swallowing, without taste.

(A) PILL OF ALOES (*compound*).

(a) *Physical properties.*—Made up of aloes, gentian, and oil of caraway.

(b) *Therapeutical effects.*—Stomachic, purgative, and emmenagogue.

(c) *Used* in dyspepsia, costiveness, and amenorrhœa.

(d) *Dose.*—5 to 15 grains.

(B) PILL OF ALOES, WITH MYRRH.

(a) *Physical properties.*—Made up of aloes, myrrh, saffron, and soap.

(b) *Therapeutical effects.*—Stimulant, cathartic, emmenagogue.

(c) *Used* with sulphate of iron in amenorrhœa.

(d) *Dose.*—5 to 10 grains.

(C) PILL OF COLOCYNTH (*compound*).

(a) Made up of aloes, scammony, cardamoms, extract of colocynth, and hard soap.

(b) *Therapeautical effects.*—A warm purgative.

(c) *Used* in habitual costiveness.

(d) *Dose.*—5 to 15 grains.

(D) PILL OF GALBANUM (*compound.*)

(a) Made up of galbanum, myrrh, sagapenum, asafœtida, and soap.

(b) *Therapeutical effects.*—Antispasmodic and emmenagogue.

(c) *Used* in hysteria and amenorrhœa.

(d) *Dose.*—10 to 15 grains.

(E) PILL OF IRON, WITH MYRRH.

(a) Made up of myrrh, soda, and sulphate of iron, mixed with treacle.

(b) *Therapeutical effects.*—Stomachic, tonic, and emmenagogue.

(c) *Used* in dyspepsia, chlorosis, hysteria.

(F) Pill of Mercury.—*Blue pill.*

(*a*) The metal partially oxydated, and mixed with confection of roses.

(*b*) *Therapeutical effects.*—Alterative and purgative, acting specially on the liver.

(*c*) *Used* in dyspepsia, torpidity of the liver, and constipation.

(*d*) *Dose.*—1 to 5 or 6 grains.

(G) Pill of the Chloride of Mercury (*compound*).

(*a*) Made up of chloride of mercury, (*calomel*), oxysulphuret of antimony, and powdered guaiacum, with treacle.

(*b*) *Therapeutical effects.*—Alterative, purgative, and diaphoretic.

(*c*) *Used* in hepatic affections, &c.

(*d*) *Dose.*—1 grain to 5.

(H) Pill of Rhubarb (*compound*).

(*a*) Made up of rhubarb, aloes, and myrrh.

(*b*) *Therapeutical effects.*—Stomachic, and a warm aperient.

(*c*) *Used* in dyspepsia and constipation.

(I) Pill of Soap (*compound*).

(*a*) Made up of opium, liquorice, and soft soap.

(*b*) *Therapeutical effects.*—The same as opium.

(*c*) *Used* like opium.

(*d*) *Dose.*—5 grains to 10.

(J) Pill of Squill (*compound*).

(*a*) Made up of squill, ginger, gum, and ammoniacum.

(*b*) *Therapeutical effects.*—Expectorant.

(*c*) *Used* in asthma and bronchitis.

(*d*) *Dose.*—5 grains to 10.

853. Pitch, Burgundy.—*The impure resin of the Norway spruce fir.*

(*a*) *Physical properties.*—A tenacious mass, of fragrant odour, semi-transparent, and unctuous.

(*b*) *Therapeutical effects.*—Stimulant and rubefacient.

(*c*) *Used* externally in the form of plaster in bronchitis, hooping-cough, &c.

854. Plaster.—A hard compound of oil and lead, which is capable of being mixed with medicated substances and melted by heat.

(A) Plaster of Ammoniacum, with Mercury.—Useful in indolent swellings of glands.

(B) Plaster of Belladonna.—Applied to the skin when afflicted with neuralgia.

(C) Plaster of Cantharides.

(*a*) Spread on leather, linen, or paper, to produce a blister.

(D) Plaster of Lead.

(*a*) Spread on linen or leather for excoriation of the skin, &c.

(E) Plaster of Soap.

(*a*) Useful to protect the soft parts from pressure.

855. Podophyllin.

(*a*) *Physical properties.*—A greyish-white mass, soluble in alcohol and water.

(*b*) *Therapeutical effects.*—Aperient, specially acting on the liver. It produces faintness in large doses.

(*c*) *Use.*—Promoting secretion of bile.

(*d*) *Dose.*—⅓ to ½ grain in combination with compound rhubarb pill.

856. Potass, the union of the metal potassium with oxygen.

(A) Potass, Acetate of.

(*a*) *Physical properties.*—A colourless, crystalline, pulverulent salt.

(*b*) *Therapeutical effects.*—Diuretic, and mildly aperient.

(*c*) *Used* in febrile diseases, dropsy, and jaundice.

(*d*) *Dose.*—20 to 30 grains.

(B) Potass, Bicarbonate of.

(*a*) *Physical properties.*—Inodorous and colourless crystals.

(*b*) *Therapeutical effects.*—Anti-acid, diuretic, and soothing.

(*c*) *Used* in acidities of the stomach and bowels.

(*d*) *Dose.*—5 to 25 grains. Used for effervescing draughts, in the same way as the bicarbonate of soda (which see).

(C) Potass, Bitartrate of.

(*a*) *Physical properties.*—An inodorous, white, acid powder, feeling gritty to the hand or teeth.

(*b*) *Therapeutical effects.*—Diuretic and slightly purgative; cooling, with any vegetable acid.

857. Potassium.—A metal never found in a separate condition, but obtained from potass, by depriving it of its oxygen.

(A) Potassium, Iodide of.

(*a*) *Physical properties.*—Solid, white, inodorous, deliquescent crystals; taste, saline and somewhat acrid; very soluble in water, and in six parts of spirit.

(*b*) *Therapeutical effects.*—Stimulant, alterative, and diuretic; also causing absorption of unnatural growths.

(*c*) *Used* in goitre and other glandular affections; also in various defective or poisoned conditions of the blood.

(*d*) *Dose.*—2 to 8 grains three times a day, united with at least 2 ounces of fluid, such as decoction of sarsaparilla.

(B) POTASSIUM, BROMIDE OF.

(*a*) *Physical properties.*—In these it closely resembles the iodide, but is more soluble in alcohol and less in water.

(*b*) *Therapeutical effects.*—Stimulant and alterative, appearing to act specially on the brain.

(*c*) *Used* in epilepsy, which it seems to control in a remarkable or specific manner.

(*d*) *Dose.*—3 to 5 grains.

858. POULTICE.—A soft and moist substance suited to external application.

(A) POULTICE OF CHARCOAL.

(*a*) Macerate for a short time before the fire 2 ounces of bread in 2 fluid ounces of boiling water; then mix, and gradually stir in 10 drachms of linseed meal; with these mix 2 drachms of powdered charcoal, and sprinkle a drachm on the surface.

(*b*) Antiseptic and digestive.

(*c*) *Used* in gangrene.

(B) POULTICE OF HEMLOCK.

(*a*) Make a poultice of linseed meal; then add 1 ounce of extract of hemlock previously softened with water, or 4 ounces of the fresh leaves scalded and bruised.

(*b*) *Therapeutical effects.*—Anodyne and discutient.

(*c*) *Used* in glandular swellings, and cancerous sores.

(C) POULTICE OF LINSEED.

(*a*) Put into a basin enough meal to form a poultice, making a hole in its centre; then pour upon it boiling water to fill that hole, and stir rapidly with a kitchen knife. This will generally be sufficient to make the poultice of the proper consistency. It is always better to add enough water at first, as it is not so smooth if added piecemeal.

(*b*) *Therapeutical effects.*—Stimulant, and yet soothing.

(*c*) *Used* for abscesses and ulcers when inflamed.

(D) POULTICE OF MUSTARD.

(*a*) Make either a bread or a linseed-meal poultice, then sprinkle over it enough flour of mustard to conceal its surface, and wet it with a little boiling water. Some people add hot vinegar to wet it with.

(*b*) *Therapeutical effects.*—Stimulant, and often inclined to blister the skin.

(*c*) *Used* as a rapid counter-irritant.

(E) POULTICE OF YEAST.

(*a*) Mix 5 ounces of yeast, with an equal quantity of water, at 100 degrees; with these stir up a pound of flour, so as to make a poultice; place it by the fire till it swells, and use.

(*b*) Stimulant, emollient.

(*c*) *Used* to indolent abscesses and sores.

859. POWDER, a finely divided and dry material.

(A) POWDER OF ANTIMONY (*compound*).

(*a*) *Physical properties.*—A dull, white, insipid powder.

(*b*) *Therapeutical effects.*—Diaphoretic and alterative.

(*c*) *Used* in febrile diseases.

(*d*) *Dose.*—3 to 10 grains.

(B) POWDER OF CHALK WITH OPIUM (*compound*).

(*a*) A mixture of chalk, spice, and opium.

(*b*) *Therapeutical effects.*—Anti-acid and anodyne.

(*c*) *Used* in diarrhœa, but requires caution on account of the opium.

(*d*) *Dose.*—5 to 20 grains.

(C) POWDER OF IPECACUANHA (*compound*).—*Dover's powder.*

(*a*) *Physical properties.*—Compound of opium, ipecacuanha, and sulphate of potass.

(*b*) *Therapeutical effects.*—Diaphoretic, anodyne, and narcotic.

(*c*) *Used* to produce perspiration in rheumatism and dysentery, &c.

(*d*) *Dose.*—5 to 10 grains.

860. QUININE, SULPHATE OF.

(*a*) *Physical properties.*—Colourless, inodorous, lustrous, bitter, efflorescent crystals; totally soluble in water previously acidulated with sulphuric acid.

(*b*) *Therapeutical effects.*—Stomachic, stimulant, febrifuge, and tonic.

(*c*) *Used* in general debility, neuralgia, and after fever.

(*d*) *Dose.*—1 to 3 grains.

861. RHUBARB.—*The root, whole and powdered.*

(*a*) *Physical properties.*—The root is in firm, flattish, irregular pieces, occasionally pierced with large holes; colour, bright yellow externally; fracture, rugged, presenting red and white veins; odour, peculiar and aromatic; taste, bitter, astringent, and somewhat nauseous; imparts its virtue to water and alcohol. The powder is of a reddish yellow.

(*b*) *Therapeutical effects.*—Purgative and stomachic; acting on the small bowels.

(*c*) *Used* as a mild purgative in the constipation of children and adults.

(*d*) *Dose.*—10 to 30 grains.

862. SAFFRON.

(*a*) A colouring matter obtained from the *Crocus sativus.*

863. SENNA.—*The leaves.*

(*a*) *Physical properties.*—Leaves of a pale green colour; leaflets broad, lanceolate; the two sides unequal; odour faint, somewhat like green tea; taste nauseous and bitter. Yields its properties to spirit and water.

(*b*) *Therapeutical effects.*—Cathartic.

(*c*) *Used* in constipation, and to lower the system; made into the infusion.

(*d*) *Dose.*—5 grains to 25, rubbed down with ginger and sugar,

864. SILVER, NITRATE OF.—*Lunar caustic.*

(*a*) *Physical properties.*—Sold in solid fusible cylindrical moulds. When recently prepared, white and semi-transparent, gradually becoming black on exposure to the air; soluble in water.

(*b*) *Therapeutical effects.*—Tonic and anti-spasmodic, when taken internally; but requiring the utmost caution, and not adapted for domestic use. Externally, caustic and stimulating.

(*c*) *Used* in irritability of the stomach, epilepsy, &c., but is apt to produce blueness of the skin; externally, as the ordinary caustic.

(*d*) *Dose.*—$\frac{1}{8}$ to 1 grain, in pill.

865. SODA.—The metal sodium united with oxygen.

(A) SODA, BICARBONATE OF.

(*a*) *Physical properties.*—A heavy white powder, without smell, and tasting slightly soapy; entirely soluble in water.

(*b*) *Therapeutical effects.*—Anti-acid.

(*c*) *Used* in the manufacture of effervescing draughts, and for acidities of the stomach.

(*d*) *Dose.*—5 to 30 grains. For the purpose of making the common effervescing draught, 20 grains are dissolved in an ounce or two of water, sweetened and flavoured at pleasure, and then 15 grains of citric or tartaric acid dissolved in water, or an ounce of fresh lemon juice being added, an effervescence immediately takes place.

(B) SODA, SULPHATE OF.—*Glauber's salts.*

(*a*) *Physical properties.*—Crystals, of an exceedingly bitter taste, and without smell; soluble in water.

(*b*) *Therapeutical effects.*—Purgative and diuretic.

(*c*) *Used* in costiveness.

(*d*) *Dose.*—$\frac{1}{2}$ to 1 ounce.

866. SPERMACETI.

(*a*) *Physical properties.*—White, semi-transparent, pearly crystals, without taste or smell.

(*b*) *Therapeutical effects.*—Soothing.

(*c*) *Used*, internally, in irritation of the mucous membrane of the bowels, and bronchitis; externally, in the making of ointments.

(*d*) *Dose.*—$\frac{1}{2}$ to 1 drachm, rubbed down with yolk of egg, or mucilage, or mixed with brown sugar.

867. SPIGELIA.—*Indian or Carolina pink.*

(*a*) *Physical properties.*—In bundles of the entire plant, about twenty inches long.

(*b*) (*c*) A very useful remedy for round worms.

(*d*) *Dose.*—10 to 20 grains of the powder, given fasting; or $\frac{1}{2}$ an ounce to 3 ounces of the infusion made by pouring one pint of water on half an ounce of the root.

868. SPIRIT OF AMMONIA (*aromatic*).—*Sal-volatile.*

(*a*) *Physical properties.*—A compound, containing carbonate of ammonia and aromatics, with spirit; and possessing an aromatic, warm, and alkaline taste; miscible with water, which it renders milky.

(*b*) *Therapeutical effects.*—Stimulant and cordial.

(*c*) *Used* as the ordinary diffusible stimulus in faintings and hysteria; also added to senna to prevent griping.

(*d*) *Dose.*—30 to 60 drops.

869. SPIRIT OF AMMONIA (*fetid*).

(*a*) *Physical properties.*—The same as the above, with the addition of asafœtida.

(*b*) *Therapeutical effects.*—Stimulant and antispasmodic.

(*c*) *Used* in hysterical fits.

(*d*) *Dose.*—30 to 60 drops.

870. SPIRIT OF HORSE-RADISH (*compound*).

(*a*) *Physical properties.*—Mix twenty ounces of sliced horse-radish, twenty ounces of dried orange-peel, 5 drachms of bruised nutmegs, and a gallon of bruised spirit, with ten pints of water; then distil a gallon with a slow fire.

(*b*) *Therapeutical effects.*—Stimulant, diaphoretic, and diuretic.

(*c*) *Used* internally in dyspepsia, and in paralysis externally rubbed into the skin.

(*d*) *Dose.*—1 to 2 drachms.

871. SPIRIT OF NITRIC ETHER.—*Sweet spirits of nitre.*

(*a*) *Physical properties.*—A colourless, transparent, volatile, inflammable fluid, of an ethereal odour.

(*b*) *Therapeutical effects.*—Cooling, diuretic, and diaphoretic; also slightly anti-spasmodic.

(*c*) *Used* in febrile diseases, dropsy, and spasm.

(*d*) *Dose.*—20 to 60 minims.

872. SPIRIT OF SULPHURIC ETHER.

(*a*) Prepared by mixing sulphuric ether with rectified spirit and ethereal oil.

(*b*) *Therapeutical effects.*—Stimulant and antispasmodic.

(*c*) *Used* in faintness, nervousness, lassitude, &c.

(*d*) *Dose.*—30 to 60 drops.

873. SQUILL.—*The sea onion.*

(*a*) A root of a pear shape, covered with several thin dry tissues, under which are oval, flaky, red or white scales; odour, pungent; taste, acrid and bitter. Imparts its virtue to vinegar, spirits, and water.

(*b*) *Therapeutical effects.*—Expectorant, emetic, diuretic.

(*c*) *Used* in chronic bronchitis and asthma.

(*d*) *Dose.*—2 to 6 grains.

874. SULPHATE OF COPPER.—*Blue stone.*

(*a*) *Physical properties.*—A salt of a beautiful blue colour, and metallic taste; soluble in water.

(*b*) *Therapeutical effects.*—Emetic and astringent.

(*c*) *Use.*—Unfit for internal use, but applied externally as a caustic.

875. SULPHATE OF IRON.—*Green vitriol.*

(*a*) *Physical properties.*—A salt of a bluish-green colour, and metallic taste; soluble in water.

(*b*) *Therapeutical effects.*—Tonic, astringent, emmenagogue.

(*c*) *Used* in scrofula, amenorrhœa, and dyspepsia.

(*d*) *Dose.*—1 to 3 grains.

876. SYRUP of orange-peel, saffron, mulberry, poppy, buckthorn, red poppy, tolu, ginger, and roses, and compounds of sugar in the form of syrup with the drugs mentioned above.

877. SYRUP OF IODIDE OF IRON is used in order to preserve the iodide of iron from injury.

(*b*) *Therapeutical effects.*—Alterative, and affording the effects of iron and iodine.

(*c*) *Used* in scrofulous diseases, and in cachectic states of the system.

(*d*) *Dose.*—½ a drachm to 1 drachm.

878. TURPENTINE, SPIRIT OF.

(*a*) *Physical properties.*—A limpid, colourless fluid, of a strong odour and hot taste, exceedingly inflammable.

(*b*) *Therapeutical effects.*—Stimulant, diuretic, cathartic, and destructive to worms.

(*c*) *Used* in hemorrhages, lumbago, &c., and to destroy worms; also externally as a rubefacient.

(*d*) *Dose.*—10 drops to 30 internally, or 2 to 4 drachms mixed with castor oil as a vermifuge; but it should not be given internally without the sanction of a medical man.

879. TINCTURE.—A solution in spirit.

(A) TINCTURE OF BENZOIN (*compound*).—*Friar's balsam.*

(*c*) *Used* internally as a remedy for chronic coughs; externally, as a stimulant application to wounds and bruises.

(*d*) *Dose.*—20 to 30 drops.

(B) TINCTURE OF COLUMBA, GENTIAN, CASCARILLA, CINCHONA, and CARDAMOMS, all possess the same virtues as the drugs from which they are derived.

(*d*) *Dose.*—1 drachm.

(C) TINCTURE OF CAMPHOR (*compound*).—*Paragoric elixir.*

(*a*) A tincture containing camphor, opium, anise, and benzoic acid.

(*c*) *Used* in coughs.

(*d*) *Dose.*—1 drachm.

(D) TINCTURE OF CANTHARIDES.—Unfit for domestic use, except as a rubefacient in combination with soap-liniment, or for the hair with turpentine.

(E) TINCTURE OF GINGER.

Dose.—1 drachm.

(F) TINCTURE OF HENBANE.—(See HENBANE).

Dose.—20 to 30 minims.

(G) TINCTURE OF IODINE. — (See IODINE).

Dose.—5 to 15 minims.

(H) TINCTURE OF LAVENDER (*compound*).

Dose.—30 to 60 minims.

(I) TINCTURE OF MYRRH.

Dose.—30 to 60 minims. Useful as a wash for the teeth.

(J) TINCTURE OF OPIUM. — *Laudanum.*

Dose.—6 to 20 minims.

(K) TINCTURE OF QUININE.

Dose.—30 to 40 minims.

(L) TINCTURE OF RHUBARB (*compound*).—*A very warm useful preparation.*

Dose.—2 to 4 drachms.

(M) TINCTURE OF VALERIAN (*compound*).

Dose.—30 to 60 minims, in dyspepsia and hysteria.

880. TOLU, BALSAM OF.

(*a*) *Physical properties.*—Of considerable consistence; reddish-brown in colour; odour, very pungent; taste, warm and sweetish.

(*b*) *Therapeutical effects.*—A stimulant expectorant.

(*c*) *Used* in chronic coughs, and also to wounds and ulcers.

(*d*) *Dose.*—10 grains.

881. TORMENTIL.

(*a*) *Physical properties.*—An irregularly knotty root, furnished with numerous fibres; inodorous; very astringent.

(*b*) *Therapeutical effects.*—Astringent.

(*c*) *Used* as an injection in the form of decoction.

882. VALERIAN.

(*a*) *Physical properties.*—Several long, slender, dusky-brown fibres, issuing from one head; strong fetid odour; warm, bitterish, sub-acid taste.

(*b*) *Therapeutical effects.*—Antispasmodic, tonic.

(*c*) *Used* in hysteria.

(*d*) *Dose.*—1 drachm.

883. WALNUTS *are popularly used for relief in violent and protracted constipation of the bowels.*

(*a*) Put small green walnuts in salt and water for nine days; change the water every third day; then place them in a sieve, and let them stand until they begin to turn black. Put them into a jug, and pour over boiling water, and let them stand until next day; then replace them in the sieve to drain. Make a thin syrup and boil them in it three or four times; then make a thick syrup, put in the walnuts, and boil them six minutes. Wet some paper with brandy to cover them, and tie all tightly down with bladder. The longer they are kept the more efficient they have generally proved. They ought to be kept at least ten years.

(*b*) *Dose.*—One large or two small ones.

884. WINE.—In medicine, a solution of any drugs in sherry.

(A) WINE OF COLCHICUM.—(See COLCHICUM).

(*a*) *Dose.*—20 to 40 minims.

(B) WINE OF IPECACUANHA.—*Ipecacuanha wine.*

(*a*) Macerate 2½ ounces of bruised ipecacuanha in two pints of sherry wine for seven days, and strain.

(*b*) *Therapeutical effects.*—Emetic, expectorant, and diaphoretic.

(*c*) *Used* in coughs and croup, also as an emetic.

(*d*) *Dose.* --As an emetic, 2 drachms to 1 ounce, as an expectorant, 20 drops to 30.

(C) WINE OF IRON.—*Steel wine.*

(*a*) Digest for 30 days an ounce of iron wire in two pints of sherry-wine, and strain.

(*b*) *Therapeutical effects.*—Stomachic, tonic, &c.

(*c*) *Used* in anœmia, amenorrhœa, &c.

(*d*) *Dose.*--Half a drachm to 1 drachm.

(D) WINE OF ALOES.

(*a*) Digest an ounce of aloes and half an ounce of canella in a pint of sherry.

(*b*) *Therapeutical effects.*—Stomachic and purgative.

(*c*) *Used* the same as other aloetic medicines.

(*d*) *Dose.*—As a stomachic, 1 drachm; as a purgative, 1 ounce.

(E) WINE OF OPIUM.

(*a*) Prepared with opium and spices.

(*b*) *Therapeutical effects.*—Stimulant, afterwards anodyne.

(*c*) *Used* chiefly as an application to the eyes.

(*d*) *Dose.*—10 minims to 20.

(F) WINE OF POTASSIO-TARTRATE OF ANTIMONY.—*Antimonial wine.*

(*a*) Dissolve two scruples of potassio-tartrate of antimony in a pint of sherry.

(*b*) *Therapeutical effects.*—Emetic and diaphoretic.

(*c*) *Used* in inflammatory diseases.

(*d*) *Dose.*—15 to 60 minims.

885. ZINC.—A metal found in a native state as calamine, which is a carbonate of zinc.

(A) ZINC, CLORIDE OF.—A powerful drug, but scarcely adapted for domestic use, except as a disinfectant, for which it is sold in solution.

(B) ZINC, OXIDE OF.

(*a*) *Physical properties.*—A light white powder.

(*b*) *Therapeutical effects.*—Tonic, antispasmodic; externally, astringent and drying.

(*c*) *Used* in chorea, &c.; and externally, as a drying and cooling application.

(*d*) *Dose.*—1 to 3 grains.

(C) ZINC, SULPHATE OF.—*White vitriol.*

(*a*) *Physical properties.*—Transparent crystals.

(*b*) *Therapeutical effects.*—Tonic, astringent, and emetic.

(*c*) *Used* as a wash or as an emetic.

(*d*) *Dose.*—As an emetic, 10 grains to 30; as a tonic, 3 grains.

CHAP. II.

ON THE VARIOUS AUXILIARIES TO MEDICINE IN RESTORING HEALTH.

SECT. 1.—INVALID DIET AND DRINKS.

886. IN COOKING FOOD, &c., FOR THE INVALID, great art is required, because the palate is morbidly acute, and disinclined to strong flavours of any kind. Thus it often happens, that seasoning which is relished in a state of health is loathed under disease; and the cook who is not aware of this fact will be almost sure to displease her employers. Hence it is, that the nurse who understands the kind of cookery which is fitted for the sick will generally succeed better than the most finished cook, because she knows by experience that all rich flavours are sure to turn the stomachs of her charge. Chicken is, for this reason, so generally liked by the sick, because its flavour is mild, while the dark and high-flavoured meat of game or ducks would be turned out of the room as soon as submitted to the nose, without even having the honour of a taste. Fat should be most carefully avoided in all animal broths, such as mutton-broth or beef-tea. Onions, garlic, and

other herbs (except perhaps parsley) are also objectionable in the sick-room; and even the faintest flavour of the first in bread-sauce will seldom be tolerated. Pepper may be used to some extent when not forbidden, and also salt; but beyond these seasonings it is seldom safe to venture far. Cloves and cinnamon, as well as nutmeg, are liked by some and disliked by others, as also are the flavours of caraways and allspice. Lemon-peel gives a clean flavour, as does orange-peel, and they may generally be used for the purpose of giving a slight taste to sweets or puddings; but even of these a smaller quantity than usual will suffice. With regard to adding wine in making jellies, it must always be ascertained whether it is forbidden, for in many cases jelly without wine would be advantageous, while the addition would be altogether wrong. The following list of receipts comprises those which are peculiarly applicable to the invalid.

887. THE SPECIAL USE of these various articles will come under the treatment of the diseases for which they are required.

888. RECEIPTS FOR ARTICLES OF DIET, &c., SUITED TO INVALIDS:—

(*a*) BEEF-TEA.—Take one pound of lean beef, pick *all* the fat off; cut it into small pieces the size of the end of the thumb, and score it still further to let out the gravy; put it in an enamelled saucepan with a quart of water, two cloves, eight to twelve peppercorns, and half a tea-spoonful of salt. Simmer for three or four hours, and skim it *as long* as either scum or fat rises, or else it curdles. In cases of *extreme* debility, one pound and a half of beef may be used. Before serving, absorb every globule of fat with silver paper.

Another Mode (very grateful in convalescence, when there is no tendency to diarrhœa). Put into a preserving jar alternate layers of beef, cut into small pieces, and sliced turnips; when the jar is filled, place it in a water-bath or slow oven, and let it remain for two or three hours; then drain off all the tea, using a little pressure to assist the operation, and let it stand till cold, when any fat may be taken off, or if wanted directly, it may be removed while hot with silver paper.

(*b*) SOUP FOR INVALIDS.—Take six pounds of shin of beef, six pounds of any white meat seasoned, and an onion if liked; put it in a stone jar, and tie down with bladder; let it boil twelve hours in a large saucepan of water; then strain it off. A tea or table spoonful is enough for an invalid, if taken several times during the day. (It is well to know, that what remains after the soup has been strained makes excellent common stock with additional water.)

(*c*) STRONG MEAT JELLY FOR WEAK PERSONS.—Take about two pounds of lean beef, cut in pieces, with a hock of ham about the same weight, and a knuckle of veal of eight or ten pounds, a small quantity of salt and mace, without any other spice; cover it with water and stew seven hours. Strain, and when cold take off the fat; clear it with whites of eggs, and pass it through a jelly-bag. The produce of jelly from the above proportions should be about five quarts; to be taken warm or cold, as best suits the patient.

(*d*) TEA-KETTLE BROTH.—Cut some small squares of crumb of bread into a broth basin, and some finely chopped parsley, with enough of salt to flavour it; pour over it some boiling water, softening the whole with a spoonful or two of cream or milk. Some invalids like the flavour of mint, and peas when in season; and if this can be allowed by the medical man, the water used must have a few young peas, or pea-pods, and a leaf of mint boiled in it, before pouring it over the bread; without this addition it is often much liked by invalids, as being so free from grease, and so clean-tasting. A little clear gravy from under the dripping-pan may sometimes be added with advantage. Pepper may be used or omitted, according to the palate or the nature of the illness.

(*e*) GRAVY-BREAD FOR INVALIDS.—Cut deeply into a joint of beef, or leg of mutton, while roasting; fill the opening with a thick slice of crumb of bread, and leave it there for half an hour, or till completely saturated with the gravy; then sprinkle upon it a little salt, with or without pepper as is recommended, and serve hot.

(*f*) TOAST SANDWICHES FOR INVALIDS.—Toast carefully a very thin slice of bread; cut off the crust; spread two slices of thin bread and butter, also cutting away the crust, seasoning each with a very little made-mustard and a sprinkle of salt, lay the toast in the middle, serving it as a sandwich.

(*g*) JELLY OR BLANCMANGE FOR INVALIDS.—Take the bones of a knuckle of veal, well scrape *all* the meat from them, and stew them four or five hours in two quarts of water; after it is cold skim it clear from all fat and sediment; melt it, and flavour with home-made wine, and a little lemon peel. If for blancmange, the stock must be still more reduced, to bear the addition of some milk, flavoured with laurel leaf and lemon-peel; the addition of a little wine or brandy will, of course, improve it.

(*h*) COW-HEEL BAKED IN MILK.—Clean well a cow-heel, and put it with two quarts of milk into an earthen jar; let it stand in a slow oven for five or six hours. The heel may be taken out, and served with a little parsley and butter, or eaten with mustard and vinegar, and the milk, which resembles blancmange, skimmed when cold, then melted and flavoured, as in the above receipt.

(*i*) SOOTHING NOURISHMENT IN CONSUMPTION.—Beat up a table-spoonful of oatmeal and a table-spoonful of honey, with the yolk of an egg; pour upon it a pint of boiling water; then boil altogether for a few minutes.

(*j*) TO RENDER MILK DIGESTIBLE IN ILLNESS.—Pour a bottle of soda-water on half a pint of boiling milk, and re-bottle it.

(*k*) FOR BARLEY WATER, LINSEED TEA, &c., see the list of Medicines.

(*l*) MILD CHOCOLATE FOR INVALIDS.—Take one square of chocolate (the sixth part of a cake, shave it, and boil a pint of water five minutes; then add a pint of skimmed milk; boil them together a little while; then add a tea-spoonful of arrowroot wetted with cold water, and boil it very slowly for five minutes longer.

(*m*) A STRENGTHENING JELLY FOR INVALIDS.—One ounce of isinglass, half an ounce of gum arabic, a pint of port wine; sweeten with sugar-candy or loaf sugar, and then flavour with cinnamon, or a little nutmeg and lemon-peel. The cinnamon may be boiled in a quarter of a pint of water for an hour; strain, and add the isinglass with another quarter of a pint of water; strain when it is dissolved, and add the other ingredients. Take a wine-glassful the first thing in the morning and the last at night, melted; or eat it cold, taking a piece the size of a nutmeg occasionally.

Another. — Take three ounces of isinglass, two ounces of candied Eringo root, and one ounce each of conserve of roses, pearl-barley, and rice. Put them in two quarts of water, and simmer about five hours till reduced to less than a pint. Put a spoonful of it into tea or any other liquid food, or take it alone.

(*n*) MUTTON CUSTARD FOR BOWEL COMPLAINTS OR CONSUMPTIVE CASES.—Take two ounces of fresh mutton suet shred fine and half a drachm of cinnamon, or some grated nutmeg, and boil in rather more than a pint of milk; when boiled, to be set by the fire till the scum rises, which should then be carefully taken off. Half a tea-cupful may be given, warm or cold, as the patient prefers, three or four times a day. It should be continued till the complaint is quite cured.

(*o*) CARAGHEEN, OR CARRAGON MOSS.—Take a quarter of an ounce of Carragheen, and steep it for a quarter of an hour in water; rinse, and put it on to boil in a pint and a half of sweet milk, a stick of cinnamon, and a bit of lemon-peel, and sugar to the taste; let it boil very gently till the Caragheen is dissolved, then strain through a muslin bag; fill the shape, and let it stand some hours before turning out. It does not require heating to turn out, but to be loosened round the edge with a knife. It is an excellent medicine for all chest complaints and coughs, and may be taken warm, a tea-cupful at a time; or, instead of boiling in milk, used as stock, and seasoned like calf's-foot jelly.

(p) Fresh Fruit Jelly.—Dissolve one ounce of isinglass in half a pint of water, then add a pint and a half of fruit juice of any kind, and from half to three-quarters of a pound of sugar, according to the taste. Boil for a few seconds, and use when cold. There is no necessity for a jelly-bag in this case.

889. Receipts for Invalid Drinks.

890. An Invalid Tap has been invented and used for some years, by which small quantities of soda-water, champagne, or any effervescing fluid, are drawn off through a cork without the escape of the carbonic-acid gas from the remainder. A borer is first passed through the cork and withdrawn, after which a small straight tap, furnished with a moveable point, is forced into the hole made by it, and as soon as the point makes its appearance at the inside of the cork it falls into the bottle, allowing the fluid to enter the tube, and to pass out as soon as the tap is turned. In this way a bottle of soda-water may be divided into five or six portions, or a bottle of champagne used by single glasses. (The tap is sold by William Richardson, 53, New Buildings, North Bridge, Edinburgh.)

891. To Mull Port.—Put half a pint of water into a clean saucepan, with three ounces of sugar and a little nutmeg and cloves; boil all together for a few minutes; then add from six to twelve glasses of *rich* port wine; do not allow it to do more than boil for a moment, and pour out into a jug ready for use.

892. To Mull Claret.—Boil gently the sugar and spice in just enough wine for the purpose; then add the remainder, and boil as above for a second or two.

893. To Make White Wine Whey.—Boil a pint and a half of skimmed milk, add two glasses of raisin or sherry wine, fifteen grains of purified nitre, and lemon-juice enough to turn the milk; boil it up, and then set it aside until the curd subsides; strain it, and add enough sugar to make it pleasant; one half to be taken on getting into bed, the other ten minutes afterwards.

894. Egged Wine.—For each half-pint of egged wine intended to be made, take two eggs, beat them up thoroughly in a small basin with an ounce and a half of white sugar (fine moist will do), and a little powdered nutmeg and cloves. While doing this, heat half a pint of sherry and water in equal quantities, or stronger of the sherry if desired; and when boiling hot stir it into the eggs, after which pour the whole backwards and forwards, from the saucepan into the basin, and *vice versâ*, until it thickens. If this from the coldness of the atmosphere does not take place, it must be put on the fire again, and constantly stirred till it does, which never fails in a few minutes.

895. Egg Flip.—This is made in the same way as egged wine (par. 894), substituting good ale for the sherry and water, and occasionally adding a little brandy, if the ale is not strong enough.

896. Rice Water is used in diarrhœa as the only drink which will not increase the mischief. It is made by boiling a spoonful of washed Carolina rice in a pint of water for two or three hours, reducing this with more water until it is thin enough to suit the palate. A little lemon-peel may be added towards the last to give flavour; and it should be sweetened to the taste. It makes a very pleasant drink. Nutmeg is liked by some people, and cloves or cinnamon by others, as an additional flavour.

897. Lemonade.—Pare two tolerably sized lemons as thin as possible, put half of the rind of one into a pint of hot, not boiling, water, and cover it over for three or four hours. Rub some fine sugar on the lemons to absorb the essence, and put it into a china bowl, into which squeeze the juice of the lemons, adding sugar enough to sweeten to the palate, and when cool it is fit to drink.

898. CONCENTRATED LEMONADE.—Take one drachm of essence of lemon, one and a half ounce of citric acid, two and a half pounds of loaf sugar, and one pint of water. To make the syrup, put the sugar into the water when cold, and let it boil gradually, then pour it hot on the acids. To make the beverage, put a table-spoonful of the lemonade into a tumbler of water.

899. ORANGEADE. — Squeeze the juice from a dozen of fruit, pour boiling water on the peel of four, and cover close. Boil water and sugar to a thin syrup, and skim it. When all are cold, mix the juice, the infusion, and the syrup, with as much more water as will make a rich sherbet; strain through a jelly-bag, and cool.

900. CRANBERRY WATER.—Bruise a cupful of cranberries, mixed with a cupful of cold water. Boil two quarts of water with a table-spoonful of oatmeal and the rind of a lemon; then stir in the cranberries, and add two ounces of Lisbon sugar and a quarter of a pint of white wine; simmer for a quarter of an hour; then strain, and leave to cool.

901. RASPBERRY VINEGAR AND WATER.—No draught is more agreeable to a feverish patient than a dessert-spoonful of raspberry vinegar mixed in a tumbler of cold water. It should never stand in any metal or glazed vessel, for the acid would act upon their surfaces to an injurious extent.

902. RHUBARB SHERBET (*a refreshing drink*).—Boil six or eight sticks of clean rhubarb ten minutes, in a quart of water; strain the liquor into a jug, in which is the peel of a lemon cut very thin, and two table-spoonfuls of clarified sugar; let it stand five or six hours, and it is fit to drink.

903. APPLE WATER.—Cut two large apples in slices, and pour a quart of boiling water on them, or on the same roasted; strain two or three hours after, and sweeten lightly.

904. IMPERIAL.—Scald a jug, and put in it from a quarter to half an ounce of cream of tartar; then add a quart of boiling water, flavour it with a little lemon-peel, or essence of lemon, and sweeten to the palate.

905. TO MAKE IMPERIAL WATER EFFERVESCENT.—Let one ounce of cream of tartar, half a pound of loaf sugar, one lemon, and one gallon of water be boiled together five minutes. When nearly cool, put in a little barm, spread on toasted bread; let it stand thirty-six hours, and then bottle. Soak the corks in warm water, and tie them down. It will be fit for use in three days.

906. VINEGAR AND LEMON WHEYS.—Pour very gradually into boiling milk as much vinegar or lemon juice as will serve to curdle it; dilute with hot water to an agreeable smart acid taste, and put in a bit or two of sugar. This is less heating than if made with wine; and if only to excite perspiration, answers as well.

907. GINGER BEER.—Put into a large pan two pounds of loaf sugar, two ounces of bruised ginger, and two gallons of cold water. Boil the whole for half an hour, skimming it well; then pour out into a large earthenware jar, adding a lemon sliced, and half an ounce of cream of tartar. Let it cool to new milk heat, then add a tea-cupful of yeast, and allow it to ferment for two days; strain it, and bottle in small stone bottles, with the corks firmly tied down.

908. CURRANT WATER.—Currant water is made by dissolving a small table-spoonful of currant jelly in a tumbler of water, and adding from ten to fifteen grains of tartaric acid. Any other fruit jelly may be converted into a refreshing drink in the same way.

909. BLACK CURRANT DRINK.—Scald out a glass, then put into it two or three spoonfuls of black currant jelly or preserve. Add a little boiling water and stir up the jelly, then fill with more water, and drink as hot as possible. Useful for common coughs and hoarseness.

910. CARBONATED WATERS.—Carbonated waters are made in two different methods, by the former of which the carbonic acid alone is forced into the liquid; while, by the latter, the salts from which it has been evolved are also contained within it. In the

one case a machine of some kind is required, in which the gas is generated, and from which it passes into the liquid to be acted on. On the large scale, and when intended to manufacture beverages for sale, these machines are cumbrous and expensive; but for private use they are now made on a simple construction, the invention of a Frenchman, and are universally to be met with under the name of *gazogenes.* Carbonic acid gas is produced by the addition of any acid to any carbonate which has a greater affinity to it than to carbonic acid, and, as a consequence, discards its old love for the sake of its new. By the usual domestic methods, carbonate of soda or potash and citric or tartaric acid are mixed together in water, and immediately evolve the carbonic acid gas, leaving in the solution a tartrate or citrate of soda or potash. Under ordinary circumstances, and for occasional use, there is no objection to this salt; and in some cases, where it is given medicinally, it is cooling and useful; but when frequently taken, it is lowering and debilitating to the stomach, and therefore the use of the machine is far preferable, particularly as the expense is exactly tho same after its prime cost has been paid, the same powders, namely, carbonate of soda and tartaric acid, being used in either case.

911. EFFERVESCING WATERS are made extemporaneously by adding to twenty grains of bicarbonate of soda (or potash) fifteen grains of citric (or tartaric) acid; about half a tea-spoonful of coarsely powdered white sugar or a tea-spoonful of syrup may be added, and, if desired, two or three drops of essence of lemon. The soda with either of the acids makes soda-water; the potash, potash-water; and the addition of the lemon and sugar converts it into effervescing lemonade. If ginger-beer is desired, it is only necessary to add about ten grains of powdered ginger instead of the lemon essence. A table-spoonful of lemon-juice (obtained from half a lemon on the average) is equal to fifteen grains of the citric acid, and may be substituted for it and the essence with advantage. The method of proceeding in each case is as follows:—Dissolve the soda (or potash) in a wine-glassful of water with the sugar or syrup, and the essence of lemon or ginger where they are used; then dissolve the acid in an equal quantity of water (or squeeze the lemon) in another glass; pour the two together, and give *immediately,* as the effervescence soon goes off.

SECT. 2.—EXERCISE AND CLOTHING.

912. EXERCISE has been already alluded to at page 11, as highly necessary to the maintenance of health; but it now becomes important to consider how far it can be made available as a means of removing disease. Here it will be found that in acute attacks it will seldom be available, inasmuch as the body is rendered unfit for it, in consequence of the almost constant presence of fever or inflammation, both of which are attended by such an excited state of the circulation as to be aggravated by any kind of exercise, and to require entire rest. In many chronic diseases, however, and especially in those of the organs of digestion and assimilation, exercise is all-important, particularly where, as is often the case, the neglect of this branch of healthy duties has been so considerable as to be the main cause of the disease.

913. EXERCISE may be divided into two kinds—*active* and *passive*—both of which are of service, but each is more particularly suited to certain conditions of the system. Both call the muscles into play, and promote the circulation of the blood, together with the general secretions; but active exercises, in addition, cause considerable waste of the materials of the blood, which aro required to supply the wearing down of the muscles engaged. They also act mechanically, by compressing and agitating the liver and other organs in the abdomen, and so aid in the digestive processes. Active muscular exertion also causes a greater quantity of air to be respired, as the result of the quicker and fuller respiration which is established by it; and as it is generally taken out of doors, the quantity of air

inspired is not only larger than in a state of rest, but it is also of better quality; and thus the blood is more fully depurated, and receives all the especial benefits which we know by experience the contact with pure air communicates, although we are unable to analyse their exact nature.

914. ACTIVE EXERCISES comprise walking, running, rowing, fencing, boxing, wrestling, cricket, and other games, archery, field sports, general gymnastics, and riding.

915. PASSIVE EXERCISES include carriage-exercise, sailing, rocking, and swinging.

916. MIXED EXERCISES are those in which the body generally is at rest, but some limb or limbs are engaged, as in the case of the active-passive motions of kinesipathy, described at page 211.

917. THE OCCUPATION AND AMUSEMENT of the mind in conjunction with the body, are always particularly to be attended to in the treatment of disease; and it is here that the greatest difficulty is experienced. It is very easy to order the patient to take a walk of a certain distance every day, but unless this kind of exercise is enjoyed and rendered interesting by some object in view at the end of it, or by amusing conversation during its progress, it will not be of that service which it is intended to afford. It is by supplying this mental stimulus that all sports and games are so useful; and therefore it is well to endeavour to interest the patient, if possible, in some one or other of them, according to his taste or bodily strength. If the weakness is very great, or there is any organic disease, violent muscular exertion, such as is required in cricket, foot-ball, &c., will be absolutely dangerous; and even if it does not increase the disease, it will do as much harm as good by over-stimulating the heart and arteries. In such cases carriage-exercise, or sailing, or a quiet ride on horseback, are the kinds most likely to do good; while in less serious changes from a state of health, it will often be of little use to advise any thing short of the most severe forms of muscular exertion, such as are comprised in fencing, gymnastics, or wrestling, indoors, or in rowing, quick walking, or running, out of doors; or what are still better, the games of foot-ball or cricket, or any of the more active field-sports, such as hunting, shooting, &c. A sea-voyage is often of great service when the body is very much disordered in its functions without any organic disease, inasmuch as at first it is generally accompanied by sea-sickness which stirs up all the secretions; and after this, the complete change in all the bodily habits, as well as the fresh air of the open sea, will brace and stimulate the system to endure exposure to the sun and air, which could not previously be borne with safety. But no good is derived from a sea-voyage unless the patient will rouse himself from the state of apathy which is experienced at first, and will go on deck and take such exercise as the state of the weather will permit. If this is persevered in day after day, whether the sea is rough or smooth, the effort is rewarded by such a change for the better as could scarcely be obtained in any other way. Carriage-exercise is now so luxurious from the smoothness of the springs and of the roads also, that except as a means of "taking the air," it is very little to be advocated. It is purely passive, considered as a muscular effort, but it exhilirates the spirits, and is therefore better than staying at home. Horse exercise is perhaps one of the most generally useful of all the various kinds, as it can be modified to suit almost any condition of the body. But it is not to be supposed that those who ride badly, or who have never ridden at all, will derive the same advantage from its use, as the practised horseman; on the contrary, they will complain of general stiffness and fatigue after a short ride, while the weaker invalid who feels at home in the saddle, will come from his ride refreshed and exhilirated by it. No exercise stimulates the liver so well, in proportion to the fatigue experienced; for though walking when carried to a sufficient extent, is perhaps more really useful, yet it demands such an amount of it as will tire the body and unfit it for other duties which must after be

gone through. Horse exercise in itself is also more amusing, as the animal ridden supplies the place of a companion to his rider; and to those who are fond of the exercise he is a never-ending source of speculation and of interest. In walking, a dog may be made to afford the same food for occupation, and by those who take no interest in either animal, botany, entymology, geology, or some other "ology," should, if possible, be taken up as an out-of-door study.

918. Of the value of kinesipathy as a means of relieving local chronic diseases, as well as those of a general character, I know nothing from practical experience; but I have little doubt that its effects are very considerable.

919. FRICTION, either with the bare hand or with the hair-glove on it, or with the towel or flesh-brush, is to be commended as a most useful mode of giving a kind of substitute for exercise. It stimulates the muscles which are rubbed, and at the same time produces a healthy glow in the skin. If performed by the patient, it also calls upon the muscles of the arms for some exertion, in order to rub with sufficient force, and may thus be said to be an active-passive exercise.

920. WITH REFERENCE TO CLOTHING, there is not much room for its use in removing disease, though it is of great service in preventing it. When once the horse is stolen, every one is ready enough to lock the stable door; and so, when disease has been set up, the clothing is made high enough to cover the chest, the exposure of which to night draughts has perhaps occasioned the disease. The same remarks apply to stays, when they have really done the harm which is often falsely attributed to them. That these articles do sometimes compress the chest I am ready to admit, and that, when the waist was worn high up under the arms, they interfered with respiration must be manifest to all; but as the fashion has moulded them for the last fifteen years and upwards, I do not consider that they have much effect on the chest, the constriction, if any, being rather on the abdomen. No doubt they are very injurious during pregnancy, because they prevent the development of new growth in organs which are of the greatest importance; and they should be removed very early in that stage, but I am not now alluding to that condition. The fact is, that if stout figures are to be made to look as slight as possible (and that this will be attempted is quite clear, till our ideas of beauty entirely change), it is better to make the pressure general by means of an unyielding material like jean with the aid of a few bones, than attempt to constrict the waist by a mere band, which will "cut" and compress the internal organs in a much more dangerous degree. Well-made stays are worn with impunity by hundreds of thousands of healthy women; and in the face of this fact, it is absurd to assert that they are necessarily injurious.

SECT. 3. — VENTILATION AND WARMING.

921. VENTILATION in sickness should be one of the first things attended to, for no treatment can be expected to be successful if it does not form part of the scheme. This has been so fully recognised in our modern hospitals, that an enormous cost is incurred in giving to the patients a large supply of fresh air; and in their wards a space of 2,000 cubic feet is the usual allowance. In private houses less than this space should not be considered sufficient, for no room forming only a cube of 10 or 12 feet, is sufficiently large for even one invalid, except in the height of summer, when the window may be open day and night. Whenever, therefore, it is possible to procure a room larger than this for the bed-room of the invalid, no sacrifice should be thought too great; and if it is to be the sole apartment, both by night and day, the necessity for at least double this cubical space is recognised by all. A chimney, or some equivalent mode of allowing the foul air to escape is also to be regarded as an essential, and if the room is of the size indicated, that is, 16 feet by 13 or

14, and 10 feet high, this precaution alone will be sufficient. When there is no chimney, care should be taken to introduce a valvular ventilator of some kind, such as Arnott's valve, an objection to which, however, with many invalids is, that it is apt to make a flapping noise in windy weather.

922. IN WARMING the rooms of the invalid, there is no mode so good in all respects as the open fire-place, which ventilates while it gives out the heat required, and by its cheerful appearance it raises the spirits of the patient, as well as the nurses and other attendants. An open grate is likewise very useful in preparing the little invalid messes, which are so constantly required in illness, so that, in every way, it is to be prized. Close stoves may be made to keep up a proper temperature, and even to afford sufficient ventilation, but they are cheerless looking things at the best. The open gas fire lately introduced answers some of the purposes of the ordinary fire-place very well, especially if the room is small; but for a large one, it cannot by any means be made to throw out a sufficient body of heat. It is somewhat extravagant also in point of cost if it is constantly kept burning, but when only occasionally wanted, as to dress and undress by for instance, there is so little waste that the saving in that respect compensates for the cost of the material. It is very convenient certainly, being so easily lighted, and never requiring to be cleaned or the fire laid, which are operations demanding the presence of the housemaid in the early morning. Altogether, therefore, it may be considered a great boon to the regular invalid who wants a fire for a short time night and morning, and especially if it is wished to avoid employing a housemaid at the latter period of the day. For further remarks on *warmth*, see page 6.

SECT. 4.—BATHS.

923. The question which is comprised under this head has been so fully considered at page 201, where hydropathy forms the subject of a chapter, that it is scarcely necessary to allude to it here, except to repeat that many of the processes there described are wholly unfit for private use, especially without the superintendence of a professional attendant accustomed to their effects.

924. THE SPONGING-BATH is usually considered to be more adapted for the prevention of disease than for its cure, excepting in some forms of inflammatory fever. In any case, however, if used at all, it may be employed as described at page 204, where it is denominated the shallow-bath, by which name it is known in hydropathy.

925. THE COLD HIP-BATH is the sitz-bath of the hydropathists (685 *b*.)

926. THE HOT BATH is exceedingly valuable in removing certain diseases, by soothing the nervous system, relaxing the muscles, and producing perspiration. In reducing the circulation, it may be made *for a time* almost equal to blood-letting. The first effect of a hot bath is to raise the action of the heart to a high degree, producing throbbing of the vessels of the head, and in some cases mischief in the brain. After a time, a profuse perspiration breaks out over the whole body; and this may be kept up for some hours by means of plenty of warm blankets. Warm baths seem to soothe the general nervous system, and are of great use in spasms of any kind, as well as in the convulsions of young children, caused by irritation; but in order to produce this effect, the body must be submitted to the action of warm water for at least fifteen or twenty minutes, and sometimes for half an hour. In the case of infants, however, more than five or ten minutes will seldom be borne without fainting. Hot baths are by no means a class of agents to be trifled with, and in medical cases, where there is time to obtain it, regular advice should be had recourse to before using them. Sometimes, however, in convulsions there is no possibility of procuring this at once, and in such case a hot bath is the remedy least likely to be improperly applied. The temperature at which a hot bath should be used varies according to the nature of the disease for

which it is employed, and to the peculiarities of the individual. Thus, some people find 100 degrees uncomfortably cold, while others can hardly endure this heat. To some a bath at 108 degrees would be quite dangerous, while others enjoy water at 120 degrees. But, on the average, it will be found that, when a soothing effect is required either for the skin or for internal organs, the water should be only *warm*—that is, from 97 degrees to 100 degrees; while, if a violent perspiration is wanted, or if spasm or congestion of an internal organ are to be relieved, it should be raised to 102 degrees or to 108 degrees, and the body should be immersed in it for at least half an hour, unless faintness is produced before the expiration of that period. After coming out of the bath, if perspiration is not desired, it is better to dress rapidly, clothe rather warmly, and then to take a gentle walk, after which there will be little inclination to break out. But if a perspiration is the object of the bath, bed is the best place for its development, and a very hot blanket should be wrapped round the naked body, with more on the top, so as to act at once by retaining the heat imbibed in the bath, and also that generated by the body, in consequence of the increased action of the heart. After a few hours' perspiration, it is generally desirable to stop it, and then the blanket may be taken off, and the night clothing put on. A very good plan is to make up the bath-bed above the usual one, putting on all the blankets required for the purpose quite independently of it, so that when the object is attained, the night clothes being slipped on, the ordinary bedding is quite warm from the heat of the body above it, and yet it is preserved dry.

927. THE ORDINARY HIP-BATH, used in orthodox medicine, is employed for various purposes with warm, tepid, or hot water, in a vessel similar to that called by the hydropathists a sitz-bath. (See par. 685 *b*.)

928. THE UTENSIL required for the hot or warm bath is of an oblong shape, suited to receive the whole body with the exception of the head. In shape it varies slightly from that of the "slipper-bath" to the full-sized fixed bath. It may be fixed in a room specially kept for the purpose, and called a bath-room; or it may be entirely detached, and intended to be filled with warm water by hand; or, again, it may be so arranged as to contain, as a part of its apparatus, a stove which shall heat its water, and which stove may also be supplied with gas or with coal as its fuel. For the hip-bath a vessel is required large enough to hold the hips only—the head and body at one end, and the legs at the other, escaping from the bath.

929. VAPOUR BATHS are intended to apply the vapour of hot-water, either medicated or not, to the skin; and for this purpose a vessel must be constructed with a steam-pipe communicating with a canopy inclosing the patient. This may be placed upon a common fire, and then the steam-rose being slipped under a cane-bottomed chair, in which the patient sits, a loose cloak or blanket is thrown round the body sometimes including the head also, and the bath is set in action, or the simple method, explained at par. 692, may be adopted.

930. For a description of the TURKISH BATH, see APPENDIX.

931. THE SHOWER BATH is a small vessel, with a perforated bottom, which is suspended over the shoulders either by hand, or as a part of a fixed apparatus. A cord is pulled, in the latter mode, which liberates the water, and it falls in a shower on the head and shoulders. In lunatic asylums, it has lately been used, with a large supply of water continued for some minutes, and the vessel for this purpose must contain twenty or thirty gallons, or even more. The safety of the plan, however, has not yet been established.

932. TEMPERATURE OF THE VARIOUS BATHS.

The Cold bath is from	50 to 60 deg.
,, Tepid ,, ...	70 to 80 ,,
,, Hot ,, ...	98 to 108 ,,
,, Vapour, not inspired ...	106 to 150 ,,
,, Do. inspired	100 to 130 ,,

933. SEA-BATHING, whether hot or cold, is intended to restore the tone of

the system when it has been reduced by any cause, such as fever, or mental anxiety, &c. It does not, however, always produce the desired effect, and in some cases more harm is done than good, especially when each act of bathing is continued for too long a time. Medical advice should, in such cases, always be obtained, defining the exact number, temperature, &c. In many cases, after a severe disease, one or two tepid baths should be used before bathing in the sea-water of the natural temperature.

934. For Change of Air, see Part III.

CHAP. III.

DOMESTIC SURGICAL APPLIANCES.

Sect. 1.—General Remarks.

935. Surgery is so completely a practical art, that it is useless to attempt to practise it without previously witnessing the various manipulations required for the performance of its several offices. There are, however, some few occasions in which it is desirable to know how to act on an emergency, even in this country, where a surgeon's aid is generally to be obtained at very short notice, and on sea-voyages, or at distant stations there is none at all within reach. I shall therefore think it right to include here a description of such appliances (and their mode of use), as can be safely adopted by any person of ordinary handiness, if at all accustomed to nursing, and to dressing slight wounds, &c. Many of them are much better left in more competent hands; but, as I before said, they are only included here for the use of those who have no choice.

Sect. 2.—The Various Methods of taking Blood.

936. Bleeding from the Arm was formerly so general, that every village kept its "bleeder" pretty well occupied, and at the rate of 1s. per arm, he gained a good livelihood. But all this is now gone by, and it is seldom that one hears of the operation being done by any one but the surgeon, and by him in the proportion of about 1 to 100, or even less, of his former phlebotomies. No one but a regular practitioner should venture to take blood except in extraordinary emergencies; and they are so difficult to decide upon, that I scarcely know one which would justify the practice. Moreover, it is rather a dangerous operation; so that looking at it in all its bearings, I think it is safer to let it alone. Perhaps, in the case of a fit of apoplexy, in which the pulse is bounding and strong, it might be adopted by any person who could depend upon his judgment being correct, both as to the nature of the fit and the condition of the pulse; but with this exception and the rare probability of some acute inflammation which has been neglected, and where the patient is at a great distance from medical help, I could never venture to sanction its adoption.

937. Bleeding from the arm is practised by means of the common lancet, which is held between the finger and thumb in rather a peculiar manner (*see fig.* 1). The arm is first bandaged with a moderate degree of tightness just above the elbow, taking care not to press so tightly as to stop the pulsation at the wrist which would cut off the flow of blood; the proof of the proper degree of constriction is the rising of the veins, which should become sensible to the eye and touch,

Fig. 1.

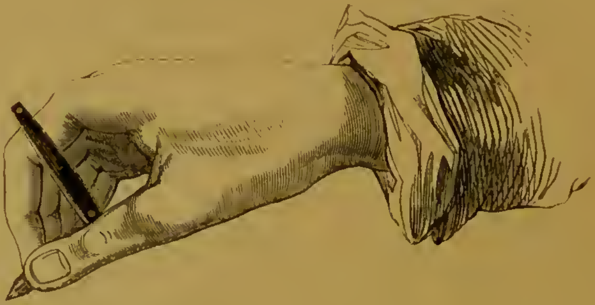
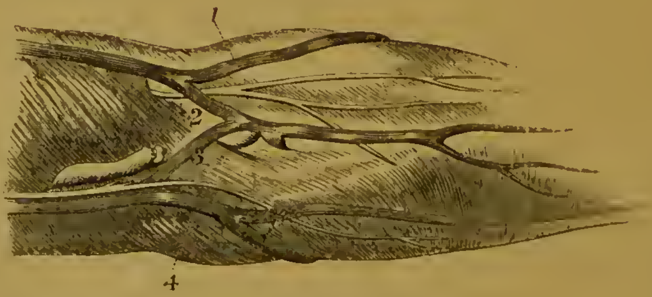


Fig. 2.



BLEEDING. P. 257.

Fig. 1. Mode of holding the Lancet.
,, 2. Veins at the bend of the arm.

and should feel tense and full. They do not remain in this state for more than a few minutes, so that it is best to have everything ready before tying up the arm. For this purpose, all that is required is,—1st, a sheet or large cloth to prevent the clothes being soiled; 2nd, a stick, such as a mop stick, to be held in the patient's hand; 3rd, a pint basin or two, if required; and if the bleeding is to be performed on a patient in bed, a wash-hand basin may be used to put the smaller one in; 4th, a bandage of broad tape about a yard and a half long, a piece of old linen to make a small compress of, and the lancet. It is, however, seldom that the amateur practitioner will obtain or want all of these, as his aid would only be called upon in such an emergency as to warrant their being dispensed with. It may, however, be useful to know what will be wanted, in case a surgeon is expected to bleed, as if they are ready no time is lost in getting them when he calls for them. When the bandage is applied twice round the arm and tied on the outside, the veins rise as shown in *fig.* 2, that being the most usual, though not the invariable distribution of them. It will be seen that three veins pass up towards the elbow on the inside of the fore-arm, and that when they nearly reach the bend of the joint, the middle one divides into two, one of which joins the outer vein, called the *cephalic*, and the other unites with the innermost one (the *basilic*). These four veins at this part are called respectively, beginning from the outside—1st, the *cephalic*; 2nd, the *median-cephalic*; 3rd, the *median-basilic*; and 4th, the *basilic* itself. Blood may be obtained from any of them, and as they vary in comparative size, the largest in any particular arm would naturally be selected; but it happens that the large artery of the arm (the *brachial*) lies immediately beneath the median-basilic vein, and therefore it is not prudent for the inexperienced hand to attempt to thrust a lancet in within an eighth of an inch of such a dangerous spot. Nor would any surgeon choose it, excepting there happened to be no other vein large enough for his purpose, which will sometimes happen. The median-cephalic, or the cephalic itself, are those most commonly chosen, and are both free from the danger of injuring the artery; but there is also a nerve which may be pricked, and which from that accident has occasioned severe neuralgia afterwards. When the spot is chosen, the thumb of the left hand is used to make slight pressure just below it, and thus to steady the vein and prevent it from rolling away from the point of the lancet, and then, by a peculiar thrust of the point, an opening is made of such a size as to allow of a stream of blood large enough to obtain the quantity required. The hand should be steadied on the three other fingers while the finger and thumb use the lancet, so that, if the patient starts, no great injury is done even by the bungler. The size of the opening required is in proportion to the rapidity with which the blood is intended to flow, a large opening and a full stream producing a greater effect upon inflammation than a smaller opening and slower flow, even if the same quantity is taken. When it is judged that sufficient blood has been drawn, the bandage is slackened, and the thumb of the left hand is tightly applied just below the opening in the vein, by which the bleeding is stopped, and then, after washing any blood off the arm which may have collected, the bandage is applied like the figure of 8, over a small compress, which is adjusted to the opening, previously taking care to bring its edges together. This bandage must be tied tight enough, but not too tight, the proper medium being scarcely to be learnt without practice. In twenty-four hours, the bandage may generally be removed with safety.

938. Bleeding from other Veins is sometimes practised by the skilled hand of the surgeon, such as those of the leg and neck. In the former situation, blood may sometimes be obtained with perfect ease and safety, when the arm is so fat as to interfere with the use of the lancet there. Care

should be taken that the veins are not varicose to any extent, as, if they are, there may be some difficulty in healing the wound, and there is also more liability to subsequent inflammation. Bleeding in the neck is only adopted in young children, with whom those of the arm and leg are so small and so imbedded in fat as to be out of reach. It is, however, a difficult operation, and attended with too much risk, to be attempted by any but the surgeon.

939. BLEEDING FROM THE TEMPORAL ARTERY may be resorted to in those cases of apoplexy in which no time is to be lost, and where the persons looking on have not skill enough to open a vein. The difficulty in this situation is not great in *opening* the vessel, but the *closing* it is not always very easy; for this, however, a surgeon may almost always be relied on in due time. There is no important organ which can be hurt beneath the artery, as it lies on the temple, and less damage is likely to ensue than from a bungling attempt at bleeding at the bend of the arm. A sharp pointed penknife also will answer the purpose sufficiently well. The artery may be felt beating about a quarter of an inch in front of the ear, soon after which point, it divides it into two branches, one of which passes forwards, and the other backwards over the ear. Whenever it is right to take blood—that is to say, whenever the action of the heart is strong, these arteries may be felt and seen beating strongly, and if there is any difficulty in finding them, it is better for the unskilled to avoid the risk of taking blood improperly. It is not of much importance where the artery is opened; but if it is over a bare surface of bone, without flesh or other soft parts, it will be more easily stopped by pressure, and such a spot, therefore, should be chosen; then taking the penknife (or lancet, if there is one), a small incision is made obliquely across the artery, so as to make sure of hitting it, and at the same time avoiding, if possible, cutting entirely through it. The blood should come in jerks, shewing that an artery is opened, and will flow freely enough if the opening is sufficiently large. When it is desired to stop it, the artery is divided straight across its course, and its two ends retracting close up by virtue of the elastic property of the coat of the vessel. Pressure must be applied by means of a compress and bandage for some days, as there is great risk of the recurrence of the bleeding, or of the formation of a small aneurism. (See *Aneurism*, par. 414).

940. LEECHES afford a very useful means of taking blood from an inflamed part, or from the skin immediately adjacent to it. They are of two species as sold in this country, one of which is bred in Great Britain in artificial ponds, the other being imported from abroad. The former is the GRAY LEECH (*hirudo officinalis*). It has a brown back, with six yellow lines along the back, bordered by a corresponding number of black lines. The mouth is placed at the taper end of the body, and is three-cornered, the other end being provided with a *gray* foot, marked with black spots. The latter is known as the FOREIGN LEECH (*hirudo provincialis.*) It is marked like the former, with the exception of the foot, which is *green*, and has no spots. In selecting them, those are to be chosen which feel firm in the hand, are of medium size, and are not pinched in at any particular point. Leeches, on the average, take about one drachm of blood each, independently of the subsequent flow, which varies greatly, according to the part where they are applied, and to the treatment adopted.

(*a*) IN ORDER TO APPLY LEECHES, several plans are adopted, always taking care to wash the skin carefully before hand, but not to allow it to soak so as to make the cuticle tough. A little milk, or a few drops of blood put on the skin, makes them bite more voraciously; or, if very obstinate, a minute puncture may be made with a lancet for each leech. If one or two only are to be used, they may be held between the finger and thumb, and their mouths directed towards the part where they are desired to lay hold; but they must be held for some little time after they seem to have caught, or they will let go again immediately on obtaining liberty to do so. When a large number are wanted, the best plan is to take a piece of wire, and bend it into a ring of a size corresponding with the space within which they are expected to fasten. Then sew round this a piece of *old* linen or calico, so as to form a little bag, in which the leeches may be placed, and at once applied to the skin, the wire at the edge being kept down by the hand and preventing their escape; or, the wire may be omitted, and a piece of old linen used without it, the fingers serving to keep the leeches in their places. Either of these modes is far better than a wine-glass, which allows of the leeches adhering to its interior, and altogether keeping aloof from the skin; whereas, the linen being porous, they cannot attach themselves to it. Wire-baskets are specially made for the purpose, but they are no better than the linen bag. When a leech is to be applied to the interior of the mouth, a leech-glass is used to protect it, which is a mere tube larger at one end than the other, and capable of containing an average leech when full of blood. In this the leech is placed with its mouth towards the small end, which should quickly be applied to the mucous membrane at the exact spot indicated, and held there until the leech has done its duty, when both may be withdrawn together, so that the leech does not at all come into contact with the mouth, except at the part where the blood is drawn.

(*b*) WHEN LEECHES ARE TO BE REMOVED, after they have done their duty (which they always will accomplish within half an hour, or not at all), one or two grains of salt may be placed upon the body, which immediately makes them let go, and begin to discharge their contained blood. This is better than picking them off with the finger-nail, though a slight touch will generally answer the purpose, and to this there is no objection.

(*c*) TO MAKE THEM DISGORGE or cleanse themselves, a grain or two of salt on each suffices, and more than this is not only an unnecessary act of cruelty, but it produces extensive ulceration of their bodies, followed by numerous deaths. In a few minutes they will relieve themselves of nearly all the blood they have swallowed, and may then be put into clean water and kept for future use, changing the water daily.

(*d*) TO ENCOURAGE the flow of blood several expedients are adopted, the most common of which is the fomentation with hot water by the aid of flannels or sponges. When this has been carried on for some time, a poultice of bread or linseed-meal is applied, and kept on until the blood accumulates to such an extent as to require a change, which must often be made. Sometimes it is not desirable to use hot applications, which have a tendency to encourage swelling, and then nothing answers better than small pieces of dry flannel, which absorb the blood as fast as it comes, and prevent its coagulation in the little wounds made by the bites of the leeches, and consequent stoppage of the flow. As fast as these pieces of flannel are used they may be washed and dried, so that six or eight pieces answer all the purposes of a greater number.

(*e*) THE TIME during which leech-bites continue to bleed varies from four hours to twelve in ordinary cases and situations; but occasionally this kind of bleeding will go on for an almost indefinite time, especially when the hemorrhagic diathesis exists, and will then require some aid to prevent an injurious, or even a fatal result.

(*f*) IN ORDER TO STOP THE BLEEDING from leech-bites, it is generally sufficient to apply a little bit of dry lint, about the size of a pea, then a larger piece over it, and both being held firmly down with a single finger, until the blood which has escaped dries and makes a durable compress. When this will not suffice, a piece of lunar caustic scraped to a firm point should be inserted in the bite, *and held there for a second or two*, which will almost always stop the bleeding if properly done; or a piece of matico leaf may be rolled up into the form of a small pill, and held against the bite by means of a small compress of lint; or, lastly, and as a certain means of stopping the bleeding, a fine sewing-needle and thread of cotton may be passed through the edges of the bite, and tied in an ordinary knot. This is easier than passing the needle through and letting it remain with the thread twined round it in the form of a figure of 8, which has been advised by some people, and answers the purpose most effectually; but the ends of the needle are apt to catch in the clothes and occasion injury, while there is no objection whatever to the mode advised above.

(*g*) Leech-bites are often followed by œdematous swelling, or by erythema, and even by erysipelas in unhealthy subjects. If either of the two first of these makes its appearance, a lotion made of a tumbler of cold water, containing a tea-spoonful of tincture of arnica, is the best remedy. The appearance of erysipelas should at once be made known to the regular medical attendant. (See *Erysipelas*).

941. Cupping is a very simple mode of taking blood, and is to be preferred to leeches in those situations where the skin is thick enough to allow of its use, as, for instance, on the back of the neck, or back, temple, abdomen, chest, and sides of the body; but on the throat and on the limbs, the skin is generally too thin to allow of the use of the scarificator, and on the face the scars left are so unsightly as to forbid its employment there.

(*a*) The Apparatus for Cupping consists of a small machine containing a number of concealed lancets, and called a *scarificator*, several glasses of various sizes, a large sponge, and a spirit torch, with a proper supply of spirit. The scarificator is so made that, after setting it by means of a steel handle, on pressing a spring the lancets are protruded through distinct slits in the case, and each makes a long and clean cut through the skin. The blades are made in a semicircular form, so that as they revolve on an axis within the box, they make a very clean wound and give very little pain. The glasses are used to produce a partial *vacuum* over the skin where they are applied by means of the lighted torch, which gives off a quantity of vapour that rapidly condenses, and thus takes off the usual pressure of the atmosphere.

(*b*) In taking Blood by means of the Cupping-Glasses much depends upon the part which is selected, and the amount required. As a general rule, it may be calculated that each glass will take about three or four ounces of blood in two or three applications; but this will vary greatly according to the nature of the skin, and the part chosen for the operation. Plenty of boiling water and towels being at hand, and the clothes guarded by some of the latter, the operator applies a sponge wrung out in the water, and as hot as possible to the skin for a few seconds, and then fixes the number of glasses in the situation which he intends them to occupy. This he does by applying their *upper* edge to the skin, and then insinuating the torch under the lower edge, it is withdrawn after a second or two, and the glass quickly applied to the surface which immediately rises up into its interior and becomes filled with blood. In about half a minute (the scarificator being set) each glass in turn is removed by the nail inserted beneath its edge, and then the scarificator is quickly applied to the middle of the raised surface, the spring is touched and the lancets do their office. It is usual to reset the instrument, and use it to each in turn before re-applying the glasses by means of the torch, which is effected exactly as before, and when they become loose (or a little before that time), they are turned down, the forefinger inserted as before, and by means of the sponge in the hand, the blood being prevented from escaping at the sides. They are then washed and re-applied as before, until the blood ceases to flow, or enough has been taken. Sometimes there is a difficulty in obtaining sufficient blood, and then a cross-cut is made with the scarificator; but this is seldom required, if the first is properly made. There is, however, considerable art in the doing the operation *well*; and an inexperienced cupper will seldom get half as much blood as a practised hand. Either the pressure is too great, which impedes the flow by the strangulation of the vessels, or it is not sufficient, or the incisions are too deep, or too shallow. It may here be noticed that a screw in the scarificator regulates the depth of the blades by withdrawing them into the body of the case, or *vice versâ*.

(c) After cupping, all that is necessary is, to fix on each set of scarifications a piece of brown or white soap plaster, and over all, a smooth handkerchief, or piece of soft linen. They are seldom followed by inflammation of any kind, and there is never any trouble in stopping the bleeding.

SECT. 2.—TOOTH-DRAWING.

942. THE EXTRACTION OF TEETH requires great practice to perform it well, and none but a dentist should voluntarily attempt the disagreeable task, except in the case of children losing their first set, when a very slight assistance will often release them of a troublesome "hanger-on." Sometimes, however, there are occasions when the tooth-ache is insupportable, and yet no professed dentist is at hand—as, for instance, during a sea-voyage, or in some distant station far from the busy haunts of civilized life; and, therefore, I shall give a short description here of the best mode of giving relief.

943. There are two plans and kinds of instruments by means of which teeth are removed. These are—1st, *the forceps*, which is similar in principle to the common tool known as "pincers;" and, 2nd, *the key*, a most powerful kind of lever, by which teeth are twisted out of their sockets. The latter is not safe in the hands of any but the skilled operator, although it is often used by most ignorant people and with direful results, in the shape of broken jaws and badly bruised gums. Its mode of use is also so difficult to learn, except by imitation, that it is hopeless, as well as useless, to attempt the task here. With regard to the forceps, the great advantage is, that with one precaution it can never do harm, although from timidity or from want of nerve, as well as from absolute carelessness, an unnecessary amount of pain may be given by it. For children's teeth two instruments only are required, one for the front teeth and another for the molars, the latter having their jaws at an angle with their handles. When they are to be used, it is only necessary to lay hold of the teeth *as close as possible to the jaw, and absolutely below the gum*, and then, by two or three side movements, joined to an elevating power, the tooth easily gives way. If the tooth is not seized low down, it is apt to be broken off or crushed, and thus leaving the patient far worse off than before, as the stump interferes with the new tooth quite as much as the whole tooth did.

944. For the removal of the adult teeth, by means of the forceps, several instruments are required, inasmuch as it is necessary that the tooth should be accurately fitted, without which it is apt to defy the efforts of the strongest arm, because the tooth escapes from its clip. Thus, two are required for the upper molars, one for each side, because of the third fang, which projects on the inner side; one will suffice for the lower molars, which have only two fangs; one instrument will be required for the bicuspids, and canines of each jaw; and lastly, one or two forceps, at least, should be at hand for the incisors above and below. If, therefore, tooth instruments are to be provided for use in a distant colony, the above are the proper ones to be selected.

945. IN EXTRACTING THE PERMANENT TEETH with the forceps, it is first necessary to loosen the tooth, and then lift it out of its socket. In holding the instrument, great care is required not to close the handles too strongly, or the tooth may be crushed; and it is also necessary, as before remarked, to insinuate it beneath the gums, so as to lay hold of the tooth below its central cavity, and avoid the risk of breaking it off.

SECT. 3.—COUNTER-IRRITATION.

946. THE PRINCIPLE OF THIS ACTION

has been already alluded to at page 187. It is here necessary to describe the various external remedies by which it is carried out in practice. These are—1st, *blisters;* 2nd, *irritating ointments and liniments;* 3rd, *setons and issues.*

947. **Blisters** consist in an artificial separation of the cuticle from the true skin by the pouring out of a quantity of serum beneath, which raises it up into a kind of bladder. They may be produced by various substances, the most certain of which is the Spanish fly, either made into a plaster (page 227), or its active property extracted, and spread on tissue paper, or by the adoption of the liquid solution of cantharides in acetous acid (par. 783). If the tissue is used, it is only necessary to apply a piece of it to the skin of such a size as the blister required, and to keep it there for ten or twelve hours. If the plaster is to be adopted, it is uniformly spread of the thickness of a shilling on leather, linen, or paper, and applied as above described. If there is a difficulty in getting the blister to rise, warmth and moisture will aid this object; and, for this purpose, nothing answers better than scalded cabbage leaves placed quite hot over the plaster. The skin of young children, under two or three years of age, is so delicate that a blister will often end in sloughing if the plaster is allowed to remain on many hours, and as it will generally rise in three or four, it is always prudent to watch it carefully at that age, and remove it as soon as it shews the slightest bladder or serum under the cuticle. Sometimes the liquor of ammonia (page 225) is used to produce a blister, when it is required to rise very rapidly; and it will effect this in a few minutes if it is applied to the skin beneath any waterproof substances, such as oiled silk, macintosh, or gutta percha. A piece of flannel should be soaked in it, and laid on the part to be blistered, and then it should immediately be covered with one or other of the above materials, or a piece of spongiopiline will serve both purposes. In either case great pain is occasioned, but it does not last long, as the whole may generally be removed in a quarter of an hour, when the blister shews itself beginning to rise. When blisters are to be allowed to heal, they may either be dressed with scalded cabbage or plantain leaves, which is the best kind of dressing, though rather unpleasant to the nose, or with the spermaceti cerate spread on lint or linen. If, however, they are to be kept open, the savin ointment is applied, and in addition, at the end of twenty-four hours, the cuticle is peeled off, leaving the true skin bare and raw, upon which the savin ointment is directly applied. From the amount of serous discharge which they produce, blisters are always eliminant as well as counter-irritant.

948. **Irritating Ointments and Liniments** are of various kinds, as described in the list of drugs already given. They merely require to be applied with or without the aid of friction to produce their effect, which is sometimes immediate, as in the case of all ammoniacal liniments, and at others, postponed for hours or days, as happens with tartar emetic and biniodide of mercury.

949. A **Seton** is a piece of silk or prepared tape passed through a fold of the skin by means of a lancet-shaped needle made for that purpose. If the tape is used, the needle has an elastic slit in it, which lays hold of the tape; but if silk is to be employed, an eye like that of an ordinary sewing needle is made. The latter is now most commonly adopted; because, although the silk becomes offensive in smell, and is objectionable on that score, yet it acts with more energy, and by its means a more regular discharge may be obtained. The operation of introducing the seton is the same whichever of them is used. It requires the aid of an assistant, who pinches up a fold of the skin, and then the operator pushes the needle through with one hand, while the other is ready to receive the point, and pull it on without delay; as soon as it is through, the fold of skin is allowed to resume its natural position, and the two ends of the silk or tape are a couple of inches apart. It

is usual to tie the ends of the silk together to prevent their accidental withdrawal, but the tape is left perfectly flat. There is generally very little bleeding, and a linseed-meal poultice may at once be applied and kept on for three or four days, changing it every night and morning, or oftener, if desired by the patient. At the end of that time, a piece of lint or linen, spread with spermaceti cerate, may be applied, and a great deal of the disagreeable smell may be avoided if it is notched half-way down its breadth with scissors at two points, corresponding with the emergence of the silk from the skin on each side, so that the middle piece lies between the silk and the skin. If the ends do not discharge, some savin cerate may be rubbed on to the silk, and drawn into the tract between the two openings. A great deal of fuss is made about drawing the silk from side to side every day, but as long as it discharges nothing of the kind is required, and if it does not, the above is all that is necessary. The proper silk is that used by stay-makers, and of this from twelve to twenty threads may be used.

950. **Issues** are similar in their action to setons, and by many are considered to be more efficacious. They are, however, more difficult to manage, having a great tendency to close by the healing process of granulation. They are made either by cutting a slit in the skin with a lancet, which is by far the least painful way, or by burning one with caustic potass (*potassa fusa*); in which operation a piece of leather, or linen spread with diachylon, has a hole cut in it of the size of the intended issue, and is then warmed and carefully attached to the skin, placing the opening over the part intended for the site of the issue. When the edge is found to be closely fixed, the potass is rubbed for some minutes into the exposed piece of skin, which soon becomes brown and rough, and then a poultice of linseed-meal is at once applied, still leaving the plaster on. This poultice must be renewed night and morning till the slough caused by the potass comes out, leaving a shallow cavity, which is to be filled with medicated peas, or small round wooden beads, sold for the purpose. Either of these are prepared by soaking them in a weak solution of sulphate of copper, of about half a drachm to a pint of water, after which they are dried; or, at first, they may be used without it. When the peas are inserted in their places a piece of soap plaster is drawn over them, and fixed tightly to the surrounding skin. In a few hours the peas swell and press into the wound, being unable to find room externally by the counter-pressure of the plaster, which ought to be assisted by a bandage. Next day fresh dry peas are inserted in lieu of the old ones, now saturated with discharge; and in this way, if desired, the size of the issue may be indefinitely increased, but generally it is not necessary to fill up the bed of the swollen peas, but only to insert such a size as will swell up to fill it.

SECT. 4.—POULTICES AND OTHER DRESSINGS.

951. **Poultices** are moist applications, which are intended to answer various purposes, according to their nature, which may be either emollient or stimulating, or a compound of both, such as those that are intended to "draw" an abscess to the surface. The following are those best adapted for domestic use:—

(*a*) **The Bran Poultice** is merely a bag of linen or flannel of a size calculated to cover the part affected, and filled with bran, which is then to have boiling water poured into it till thoroughly wet, after which the bag is fastened at the mouth, and wrung out in a cloth or towel till it no longer drips, when it is to be applied as soon as it is cool enough for the skin to bear.

(*b*) **The Bread Poultice** is made by cutting a slice of stale bread of about two-thirds the size of the intended poultice to allow for swelling. Then put this into a basin, and pour boiling water over it, let it stand ten minutes, drain the water off without breaking the bread, which is then to be turned into a piece of linen and applied as it is. *Or*, it may be beaten up very fine with the addition of a little milk or oil, and inserted in a muslin bag, the mouth of which is to be sewn up. This last, however, is not so good a method, except for some particular parts.

(*c*) THE LINSEED-MEAL POULTICE is made as follows:—Put into a basin some meal and make a hole in the middle with a broad *dinner-knife* (not a spoon), then pour boiling water upon the meal, calculating, as nearly as may be, the exact quantity which will make the poultice of the proper consistence; stir all up together rapidly with the knife, and if too stiff, add more water, or if too thin, more meal. Lastly, spread the mass upon a piece of old linen up to within half an inch of its edge, which should be turned over the poultice all round.

(*d*) OATMEAL may be made into a poultice in the same way as the linseed-meal, or the two may be mixed in any desired proportion. The oatmeal is more stimulating and "draws" more rapidly than the linseed-meal, but it does not form such a smooth and tenacious mass.

(*e*) A YEAST POULTICE is sometimes used for foul ulcers or abscesses, which it often seems to agree with. It is made by stirring two table-spoonfuls of yeast into a pound of flour, and putting it by to ferment in a moderately warm place. In a few hours the mass swells, and is filled with gas-bubbles, when it is to be made of the proper consistence with water, either hot or cold as may be desired.

(*f*) THE MUSTARD POULTICE is intended to act as a counter-irritant, and is generally made with flour of mustard and water (or vinegar), mixed of a proper consistence and spread on linen. A far better plan, however, is to make a common bread poultice (*b*), and when spread on linen of the proper size, to sprinkle it thickly with the flour of mustard, which may be slightly damped with the boiling water. Few people can bear the poultice made in this way for many minutes, and it will often blister the skin.

(*g*) CARROT POULTICE is made by boiling carrots till quite soft, and then mashing them into a pulp. There is no great virtue in it.

(*h*) HEMLOCK POULTICE is made either by scalding the fresh leaves when they are in season, or by mixing with a bread poultice (*b*) a drachm or two of the extract of hemlock.

952. LINT is either old linen scraped so as to produce a fibrous surface, or an imitation of this manufactured expressly for the purpose. It is intended as a vehicle for various dressings.

953. THE WATER-DRESSING consists in lint dipped in water (either cold, tepid, or warm,) and applied to the skin with a covering of oiled silk or thin gutta percha. It is very useful in many cases of slight injury, &c.

954. SPONGIO-PILINE is a modern invention, and consists in small pieces of sponge worked up in the form of felt, with woollen fibres, and then coated on one side with a waterproof material. It is intended to supersede water-dressing and poultices, when used either with cold water in the place of the former, or with warm instead of the latter, and by some surgeons is considered superior to them, but as far as my experience goes, it is inferior to both. But as a vehicle for liniments, I think it admirable; it may be sprinkled with a few drops of any stimulating embrocation, on the rough side, and when this is applied to the skin, it rapidly causes a glow, and if strong enough, such severe irritation as to be almost unbearable. Whenever, therefore, any stimulants are used with it, their strength must be considerably moderated, or they will not be tolerated by most people.

955. THE TOW-PLASTER is a very cooling and soft dressing in hot weather, when there is much discharge from a sore requiring a substance to absorb it, and yet any thickness of cotton or lint would be too hot. It is made by taking some clean and well dressed tow, and drawing out a few fibres on a board or table by pressing on them with the heel of the left hand, while the right

Fig 1.

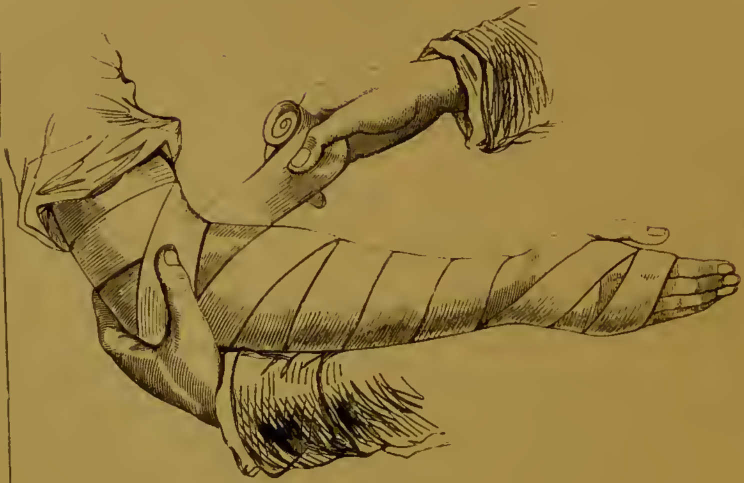
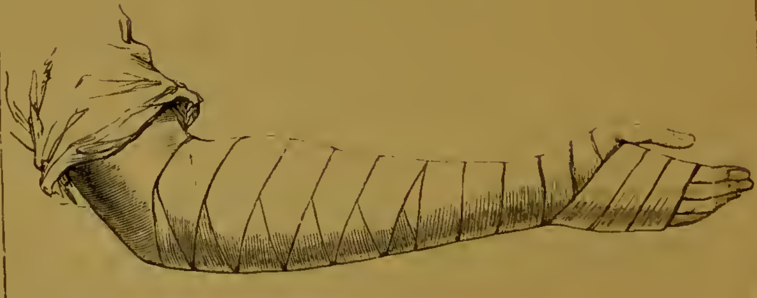


Fig 2.



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draws the body of the tow away. By adding fresh portions to this, a large smooth mass may be obtained; and by turning in the ends and edges, this may be made to assume any shape which is required, and can even be spread with cerate by a little dexterity. A very old and cooling dressing is this tow plaster, spread with calamine cerate. It is also much cheaper than lint.

956. Raw Cotton, often called Medicated Cotton, though really free from all drugs, is now extensively used as an external application for various purposes. It is very useful in severe burns, and as an application to the joints in acute rheumatism. It is sold by most druggists by the pound, the price being generally about 3s. or 4s. per pound.

957. The Irrigating Process is a most valuable kind of application or dressing in many accidents and inflammations of the skin. It requires a very gentle stream of lukewarm water to be conveyed over the part affected, which may nevertheless be bandaged in any way to keep the parts together. A vessel of water containing about a gallon should be raised above the part to be irrigated, and this must be kept at the desired temperature by a lamp placed beneath it. From the bottom of this a small tube, furnished with a stop-cock, is conducted to the limb, which is placed on a sheet of waterproof material, so arranged that the water can flow off into a vessel below it. When all is ready, the stop-cock is turned, and the stream, which should be a very small one, is carried on to the dressings by means of a thread or two of worsted, so as to avoid any sensation of dripping, and runs off at the bottom into the waterproof, and finally escapes. If the water feels too hot the lamp must be depressed, or if too cold it may be raised, the feelings of the patient being the best guide. By means of this flow of water, inflammation may be avoided, or kept down in a most extraordinary manner, and its value in lacerated wounds is extremely great.

958. Bees-wax melted and applied with a brush, as cool as possible without setting, is a capital application for the old and indolent "sore-legs" of working people who require protection from injury, united to moderate pressure, which when applied by their ordinary bandages is apt to "cut" and indent the ulcer, and thus act very injuriously.

Sect. 5.—Bandaging.

959. Nothing in surgery requires more practice than bandaging, in order to acquire complete command over the material which is used, which is either calico or flannel. The former should not be too fine, but must be open in its texture, and free from "dressing," by which is meant the lime used in its manufacture, to give a false appearance of stoutness to it.

960. Calico Bandages are made of various lengths and breadths according to the part for which they are to be used, and also to the purposes for which they are intended. The ordinary bandage for the leg is two and a half inches wide and six yards long, and this will just reach to the knee, if applied all the way up from the ball of the foot. It will also serve for many other purposes. That for the arm is usually two inches wide and three or four yards long. For the fingers a narrow slip of calico, three-quarters of an inch wide, is the best, and about a foot long.

961. Flannel Bandages may be used for the limbs, when they are required of the same dimensions as those given above; or, if for fracture of the ribs, they may be nine inches wide and six or eight yards long.

962. Bandages of all kinds and sizes should be rolled tightly before they are applied. For this purpose the young beginner should get an assistant to hold one end while he begins to roll the other, which is done by first doubling it up three or four times, and then beginning to roll this very tightly, straining at the bandage held at the other end all the time. A bandage thus rolled should be quite hard, and it then unwinds smoothly, and may be applied without a crease.

963. In applying all Bandages, the chief art consists in straining

them to the proper degree, and in avoiding undue or irregular pressure. To effect this, the pull must be from the whole roll of the bandage held in the hand, and not from a part of it held tight by the finger as is very commonly done. It is, however, almost useless to attempt a description of the art, which requires an ocular inspection to understand its nature. There are two different leading principles in using all bandages, one of which consists in allowing the bandage to take its own direction, as it were, so long as it lies smoothly, and then to bring it back again by a little coaxing, so as to cover in, the second time of going over the limb, the parts which have been left exposed in the first *(see fig.* 1). In the other mode, a half turn is made in the bandage whenever there is a tendency to leave a part uncovered, and by its means the direction of the calico is returned to very near its old path (*see fig.* 2).

964. IN APPLYING A BANDAGE to the arm-pit, nothing answers better than a large silk handkerchief *(see fig.* 3), or a calico bandage may be put on in the same way.

965. FOR THE HEAD a calico bandage may be applied as in *fig.* 4 A; or a handkerchief may be put on, as shown at *fig.* 4 B; two corners being at once brought down and tied under the chin, and the other two crossed at the back of the neck, and then also tied in front.

966. A SLING is often required to keep the hand or fore-arm supported, and for this purpose nothing is better than a large silk handkerchief, which should be spread out from the elbow to the heel of the hand, and should always keep the latter as high as the former, or perhaps a little higher. The cradle-sling is a piece of leather or mill-board, bent and united at one end, so as to receive the fore-arm and hand, and keep them completely at rest, being slung by tapes over the shoulder, and round the neck.

SECT. 6.—MISCELLANEOUS APPARATUS.

967. SPLINTS are thin pieces of wood, metal, or gutta percha, which are intended to be used outside a limb when its bone is broken. They should always reach at least from joint to joint, and may either be used in two portions or in four, which latter number is only required for the arm and thigh. The use and application of these will be further alluded to under the head of *Fractures.*

968. SYRINGES are of various kinds and sizes—consisting chiefly of the ear-syringe and enema-syringe; in addition to which may be mentioned the breast-pump, which will be better described under the chapter on the *Management of the Lying-in Room.*

(*a*) THE EAR-SYRINGE should contain four ounces, and have two or three different sized pipes, so as to throw a large or small stream into the ear.

(*b*) THE ENEMA-SYRINGE may be of metal, in which case it has metal valves, and requires two hands to use it, or it may be entirely of vulcanized india-rubber, by which means it may be so managed as to require only one hand. In either case any quantity of water, or other thin fluid may be used, the supply pipe being dropped into the vessel which contains it *(see figs.* 5, 6*)*. The old-fashioned globular syringe, made with india-rubber, is a most awkward instrument; and though still a good deal used, is entirely superseded in efficiency by one or other of the two kinds described above. When intended to be used as an enema-syringe, or for the ear, or other similar purposes, a common piston-syringe answers much better.

969. FOR STOPPING HEMORRHAGE from large vessels in the limbs, a *tourniquet* is used by surgeons, which is made in two ways—1st, the old instrument which tightens a strong bandage round the limb; and 2nd, the screw-tourniquet, which acts by clipping the limb as in a vice, and thus making pressure only where it is wanted. These instruments can only be required in extraordinary situations, and therefore I shall not further allude to them here, as a few practical lessons in their use can in such cases always be ob-

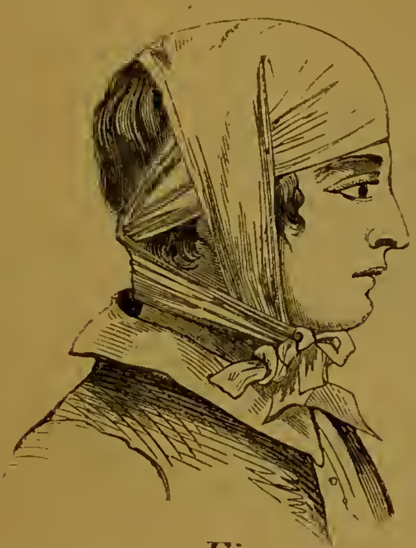


Fig. 4. a

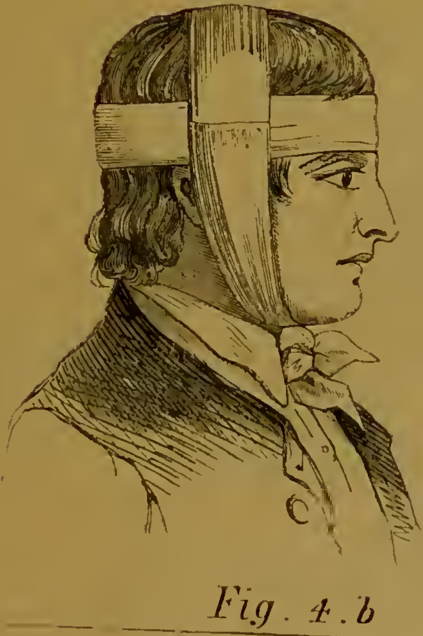


Fig. 4. b

BANDAGES.

Fig. 3.

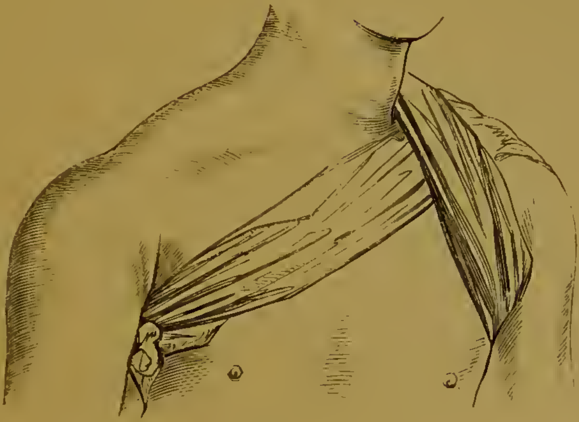


Fig. 5

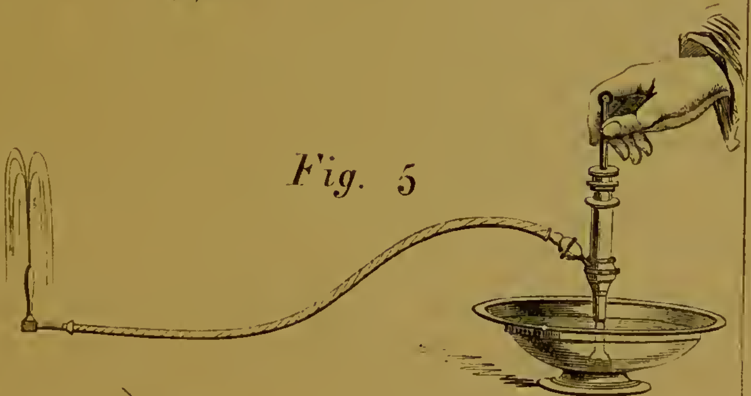
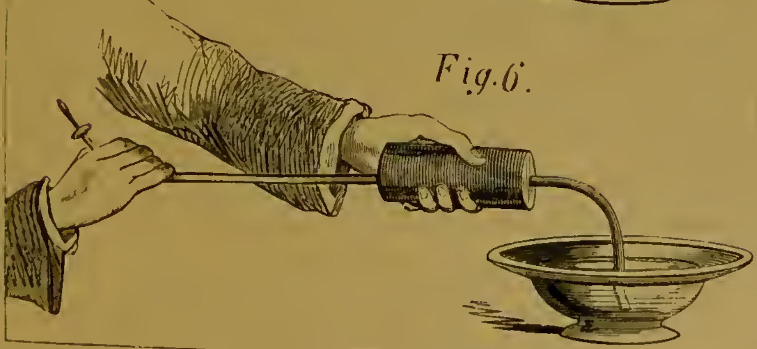


Fig. 6.



BANDAGE AND ENEMA SYRINGES. P. 266.

tained. When, however, an accident happens, attended with alarming hemorrhage, a bandage or handkerchief may always be tied round the limb *above the wound*, and by inserting a ruler or short stick in this and twisting it, the circulation may always be stopped until surgical assistance arrives.

SECT. 7.—VACCINATION.

970. VACCINATION is adopted as a means of preventing or moderating the attacks of small-pox, as already described at page 35, where the course of the vesicle, from day to day, is minutely given with illustrations.

971. THE OPERATION is performed either with the fresh lymph just taken from the arm, or with ivory points on which it has dried, or with lymph contained between two small pieces of glass. The matter should be taken on the eighth day from that on which it was inserted—that is to say, on the same day in the following week. A lancet rather blunted by use answers better than a very sharp one, and with it the surface of the vesicle is pricked in several places, taking care not to go deeply enough to cause any bleeding. With the lancet thus charged, four oblique pricks are made; two on each arm, about an inch apart, and in the hollow which exists on the outside, just below the shoulder. It is scarcely necessary to draw blood, and if the lancet is not too sharp, the incision may be quite deep enough, without the loss of more than a single drop of blood. Some people prefer a superficial scratch, rather than a valvular or oblique prick; but when the lymph is inserted in that way, it is very apt to be rubbed off. If the lymph contained in the glasses is used, it must be moistened with a drop of water a few minutes before inserting it, and with the point of the lancet it may thoroughly be dissolved, and then used as if fresh from the arm. When points are employed, the incisions or pricks are first made with the lancet, and then the points are introduced into the opening and allowed to soak there quietly for a second or two to dissolve the lymph in the blood; after which they should be well rubbed into the little wound, and after being carefully deprived of the lymph on them, they should be withdrawn. In any case the blood on the arm should be allowed to dry before the dress is replaced.

BOOK II.

ON THE MANAGEMENT OF CHILDREN IN HEALTH AND DISEASE.

CHAP I.—PECULIARITIES IN THEIR TREATMENT.

SECT. 1.—INFANTILE THERAPEUTICS.

972. At page 222, a table drawn up by Gaubius is given, in which an attempt has been made to modify the dose in proportion to the age of the child. This table is in the main pretty correct, but there are several exceptions, as in the case of opium, of which the dose for the infant, calculated by this scale, is far too large. But independently of the dose, it will be found that the action also is different, so that it becomes necessary to re-examine those drugs which are wanted in the diseases of children. It will be seen that they are not very numerous as compared with the long list already given.

973. **THE FORM** in which medicines can be given with most facility to children is that which must be selected; and here there is less choice than for the adult, since we are deprived of the use of pills and all solid forms, except lozenges, which are perhaps applicable to slight cases of cough. The choice, therefore, is only between mixtures and powders, and the bulk of both should be as small as is consistent with their efficacy. The following will comprise the chief remedies which can be required for the infant, while after the third or fourth year, the action of drugs is nearly the same in kind (though differing in degree) as in the adult.

974. **APERIENTS** are very often absolutely necessary in the infant, but not so much so as is supposed by many mothers, who are never contented without giving an occasional dose. When the stomach has been overloaded with improper food, it is better certainly to get rid of it by means of a little castor oil, than to allow of its continuance as a perpetual source of irritation; but far better than this is the abstinence from the use of this improper food, which ought to be the mother's first care and chief task. Some children are, however, naturally inclined to be costive; but with them medicine may often be avoided by giving an increased quantity of fruits and green vegetables. Figs, tamarinds, or roasted apples may be obtained even in the winter, while in the summer there is a constant succession of fruit or vegetables. Enemas of water or gruel, with castor oil, may also be tried instead of drugs, and very often succeed in procuring the evacuation of the bowels, without the injurious effect of all medicines of this kind on the stomach; or an oblong piece of soap may be wetted and passed into the rectum, which will sometimes have the desired effect.

(*a*) **THE FOLLOWING MILD APERIENTS** are suited to slight cases of constipation, or to irritation from the presence of indigestible food.

CASTOR-OIL.—Half a tea-spoonful for the new-born baby, or a tea-spoonful to a dessert-spoonful for the older child.

SWEET ESSENCE OF SENNA is a mild aperient in the dose of half a tea-spoonful to a tea-spoonful; but it is too griping for the young infant, and should not be used before the second year.

MANNA is an excellent aperient for babies, dissolved in a little warm water, the dose being from 5 grains to 15.

FLUID MAGNESIA is well adapted for any age, especially when there appears to be a disposition to form acid. The dose is half a tea-spoonful to a dessert-spoonful, in water or food, in which last it is not detected, as it has little or no taste.

RHUBARB AND MAGNESIA, mixed in equal weights, form a most generally useful powder, known by the name of *anodyne powder* and *Gregory's powder* in different localities. It is usual to add about half a grain of aromatic powder to each dose, which is about half a tea-spoonful to a tea-spoonful of the mixed powder.

(*b*) For more active Aperient Purposes, one or other of the following may be used; but they should seldom be had recourse to, as their frequent exhibition is apt to weaken the tone of the stomach, although they render the child more lively, and apparently improved in health for a time.

Calomel, gr. ½ to ij.
Powdered rhubarb,
,, jalap, of each gr. j to iv.

Mix, and give in some thick vehicle.

Powdered rhubarb, gr. j to iv.
,, ipecacuanha, gr. ⅛ to ½.
Aromatic powder, gr. ¼.

Mix, and give once or twice a day, when the liver does not act.

Or, give the same powder, with the substitution of mercury and chalk for the ipecacuanha.

(*c*) When the object is to cool the system, there is nothing so good as the following, namely:—

Bitartrate of potass, gr. xx. to xxx. dissolved in a wine-glass of boiling water, with the addition of a little sugar.

975. Astringents are chiefly required to stop diarrhœa in infants, and for this purpose the ordinary chalk-mixture is the best. A tea-spoonful of this, with one or two grains of aromatic confection, will generally suffice.

976. Blisters must be used with great care in young children, as they are apt to produce extensive and deep sloughs if kept on too long. In young babies they rise in about three hours, after which time they must be constantly watched, and should be removed as soon as there is the slightest evidence of a blister. They are invaluable remedies in numberless infantile disorders. The blistering tissue acts very well on children, but it is difficult to keep it on.

977. Blood-letting, when desirable, is generally effected in children by means of the use of the leech. Two small ones, or one large one, will generally take as much blood as the child will bear.

978. Carminatives are more often required by infants than by adults, and few children are reared without taking them at some time or other, when they are thought to be "troubled with wind." Of these the following are the best:—

(*a*) Dill Water may be given with a little sugar, in the dose of half a tea-spoonful to a young baby. It certainly agrees with most children, and especially with those brought up "by hand."

(*b*) Dalby's Carminative is a favourite in almost all nurseries, and when properly prepared, without too much opium in it, is a harmless and really useful remedy. It is, however, sometimes sold with a considerably larger quantity of laudanum in it than is safe, and therefore parents should be careful in ascertaining that it is obtained from a respectable druggist. It is said to be prepared from the annexed recipe:—

Take of Carbonate of Magnesia, grs. xl.
Tincture of Castor, gtt. xxx.
,, Cardamoms, gtt. xxx.
,, Assafœtida, gtt. xv.
Oil of Mint, gtt. j.
,, Aniseed, gtt. iij.
Laudanum, gtt. v.
Spirit of pennyroyal, gtt. xv.
Peppermint water, ℥xij.

Mix. From five to fifteen drops are given in a little food to a young infant, and more in proportion to the age.

979. Fever Medicines are often necessary in children, but are seldom required for the first few months of life. Either of the following may be adopted:—

(*a*) Take of bicarbonate of soda, ʒj.
Sweet spirit of nitre, ʒiss.
Tincture of henbane, ʒss.
Citric or tartaric acid, gr. xl.
Syrup or sugar, ʒij.
Water, ℥iiiss.

Mix, and give a tea-spoonful, dessert-spoonful, or table-spoonful every four hours, according to the age.

(*b*) Take of nitrate of potass, gr. xxiv.
Sol. of acetate of ammonia, ℥ss.
Tr. of henbane, ʒiss.
Syrup or sugar, ʒij.
Water, ℥ij.

Mix, and give a tea-spoonful, or dessert-spoonful every four hours, according to the age.

980. Emetics are very useful in children's disorders, which they often cut short in a remarkable manner. They are, however, objectionable when required frequently, as they are apt to weaken the tone of the stomach. The two following are chiefly used, the first being the safest:—

(*a*) Take of ipecacuanha wine, ℥ss.
Syrup of saffron, ʒij.
Water, ʒx.

Mix, and give one or two tea-spoonfuls every quarter of an hour till vomiting is produced.

(*b*) Take of tartar emetic, gr. j.
Syrup or sugar, ʒij.
Water, ℥iss.

Mix, and give one-eighth to one quarter of it every ten minutes, till vomiting is established.

In giving emetics their action should be assisted by drinking plenty of warm water.

981. Expectorants are almost useful class of medicines for children's pulmonary diseases; but their action in no way differs from that which they establish in the adult, the dose only requiring to be adapted to the age.

982. Tonics also require no remark, their action being identical in the child and in the adult.

983. The effect of Baths is also much the same, as in the adult; but the warm-bath cannot be continued with safety longer than five or six minutes in every infant.

Sect. 2.—Obscurity in the Symptoms in Children's Diseases.

984. Inasmuch as young children neither possess the power of examining their sensations, nor of communicating any account of them to others, for want of language, it is certainly more difficult to make out the nature of the symptoms, which are partially exhibited, than in the case of the adult, who can often give all the information that is wanted. We can generally tell when pain is present; but it is often very difficult to ascertain its exact locality. It is, therefore, only by certain *physical* signs that we can ascertain what is going on, and these will generally serve the purpose if carefully observed.

985. The expression of the countenance is useful as a guide to the detection of the disease at all ages; but in the child, it is the most important of all. Thus, whenever there is any inflammation going on in the lungs, the sides, or wings of the nose contract and dilate in a remarkable manner, which serves at once to detect the disease. So, also, when the brows are knit, the eyes fixed, or looking wild, the head is almost sure to be the seat of the disease, and if, in addition, there is a fixed squint, no doubt exists on the subject. When neither of these expressions is visible, and there is a drawing down of the angles of the mouth, the stomach, or bowels, are most likely affected, and if to this is added an expression of pain, there is either inflammation or colic.

986. The attitude will often serve to indicate the locality of the disease, as the child is very apt to point, or indicate with the hand, where the seat of its sufferings is to be looked for. Thus, in hydrocephalus, or in ordinary headache, the hand is constantly raised to the head, while, in enteritis, it will find its way to the abdomen, if allowed to do so. Pain almost always occasions more or less rigidity of the limbs, while an absence of this symptom is indicated when the child lies with its limbs flaccid and yielding, though this may also arise from the extreme exhaustion which attends the last stage of some fatal diseases.

987. The state of the Skin must never be neglected, as it affords an excellent guide to the degree of fever present. In children the skin becomes intensely hot in all feverish attacks,

and is often deprived of all appearance of moisture, which should be anxiously looked for by the mother or nurse, as an indication of improvement.

988. **THE PULSE** in the child, when at all affected by disease, is raised or lowered in a much more marked degree than in the adult. It is very common to meet with a pulse in the infant so quick as to be beyond our powers of counting it, and which yet does not always mark a highly dangerous condition. It is, however, one requiring prompt treatment, and always should lead to an anxious superintendence as long as it lasts.

989. **THE CRY AND VOICE** of the child indicate very clearly what is its condition as to pain or discomfort. In the infant, if robust, the cry of acute and recent pain is clear, loud-sounding, and continues for some little time; while that attending upon long-continued suffering is more of the nature of a wail, and is not nearly so sharp as in the first-mentioned case. A hoarse cry indicates some affection of the larynx or trachea; and, if there is a ringing or sonorous tone with it, croup may be expected. The parrot-like scream of hydrocephalus is too marked to be unnoticed by any one accustomed to the care of young children.

990. **IN ACUTE DISEASES** the degree of emaciation is a matter of little importance; but in chronic cases the amount of flesh lost should be carefully noted, as it often indicates the extent of the internal mischief. Thus a swelling of the abdomen, with great loss of flesh, would be almost sure to be connected with mesenteric disease, while, on the other hand, if the limbs remain plump, it might safely be predicated that no such disease existed.

CHAP. II.

THE TREATMENT OF THE NEW-BORN CHILD IN HEALTH AND DISEASE.

SECT. 1.—MANAGEMENT OF THE HEALTHY INFANT DURING THE FIRST MONTH.

991. After the new-born child has been washed and dressed, which must necessarily be done by some one accustomed to the task, the next thing is to take care that it is properly fed. In all suckling animals but woman, the milk makes its appearance with the young; and in a state of nature—that is, among savages—I believe it is also the case; but in civilized life, as before remarked, it does not show itself till the end of the second or third day; and in the interval the child has nothing to fill its stomach. Either, therefore, it must starve, or it must have some kind of artificial food; and, as young animals in thirty-six hours naturally require a good deal, the latter alternative is adopted, without which many delicate children would absolutely sink, or become so exhausted, that at last, when food was offered them, they would be too weak to take it. The first thing in general given to an infant by the nurse is a little thin and very smooth oatmeal gruel, which is a very good material for working off the black pitchy matter (*meconium*) contained in the intestines of the child at birth. Sometimes with this, and at others by itself, the nurse generally administers a couple of drops of castor-oil, which is very innocent in its effects, and though not necessary, yet there seems to be no sufficient reason to object to it. I have the greatest dislike to interfere with the proceedings of any servants which are universally customary, unless there is some valid reason to be given; and,

therefore. I should not advise the omission of this practice, however unnecessary it may be. It appears to carry off the viscid contents of the bowels more speedily than by the natural mode, if not more effectually, and there do not appear to be any ill effects from it. After the first day, if the mother's milk is not come, a little lukewarm cow's milk and water, mixed in equal proportions, and sweetened with loaf sugar, should be given in a feeding-bottle with a nipple of India-rubber, varnished white, which is now very generally sold for the purpose. By the use of this nipple the child becomes accustomed to its natural mode of sucking nourishment; and, when the mother's breast is full of milk, it soon transfers its attention to it. An infant at this age will require a little food at a time, but often, namely, every two or three hours. If the mother's milk is delayed long, and there is much difficulty in getting it to flow, the child will sometimes show some reluctance to change its feeder; but by an hour or two's starvation, it will generally lay hold, and then, in most cases, no further feeding will be necessary, for at least the first month. When, however, the mother's milk is scanty, equal quantities of cow's milk and water, sweetened with sugar, or of cream and arrowroot made with water, and also sweetened, should be allowed two or three times a day, and especially during the night. Oatmeal, wheat-flour, and all such coarse articles, are unfit for the very young infant; as also are biscuits, tops and bottoms, rusks, and similar kinds of food. Nothing answers better at this early age than water-arrowroot, with the addition of a little good cream and sugar; about one tea-spoonful of cream is generally enough for each quantity given at one time, and it should be mixed as it is wanted, care being taken that it is not sour. From the first, this food, whether natural or artificial, should be given at regular intervals, which may vary from two to three hours, according to the seeming wants of the child. But whatever period may be thought best, it should be maintained with punctuality, unless the child is asleep, and even then it is better to take it up and feed it if it sleeps more than an hour beyond its regular time, excepting in the middle of the night, when a single feeding time may be omitted.

992. THE PROPER PLACE for the sleeping of all infants, *except in very cold weather*, is the cradle. When, however, the child is weakly, or when the room is cold, and especially when both these causes combine together, there is not sufficient power to generate heat enough for the purpose of keeping up a proper temperature, and in such a case the mother's bed is the proper place. Generally, by day, the room may be warmed sufficiently; but at night, when the fire burns low, and when the temperature naturally falls, it will be found that even a strong infant will become cold in its extremities, if left in the cradle. A warm brick, or hot bottle, placed at the feet, will warm these parts; but the arms and face continue exposed, and are generally chilled. Warmth is undoubtedly of the utmost importance to the welfare of infants; and if it cannot be provided in any other way, the mother's body must be used as a means of procuring it. The objection is that, in the first place, it is rather too high a temperature; secondly, that there is danger of overlaying the child; and, thirdly, that the plan is difficult to leave off. In any case it should only be adopted at night, and then with a little caution, the second named objection will not often be applicable. The use of a warm *down* pillow in the cradle for the child to lie upon, with good blankets over and the bottle before-mentioned, will be very advantageous, and, in all but the winter months, quite sufficient to dispense with the mother's bed.

993. THE CLOTHING OF THE NEW-BORN CHILD in this country generally consists of the following articles, the essentials being that it shall be moderately loose, soft, and warm. They consist of—1st, an outer garment, variously ornamented, and named either a night-gown, day-gown, or robe; 2nd, of two

flannel articles, which are pretty much the same in all cases, and called "long flannels" and "barrows;" 3rd, of the shirt next the skin; 4th, of a swathe for effecting a certain amount of pressure at the navel; and 5th, of the diaper napkins and flannel squares. The skin at this age is so tender, that it is most readily chafed. Very fine French cambric, or lawn, is the proper material to be placed next the skin, according to the received notions of the powers that be, who assert that anything else is sure to chafe; and yet they fasten up the lower parts of their charge in strong diaper, without experiencing this calamity. No part is so liable to chafe as the inside of the thigh, which, it is true, is often in that condition; but if this part can bear a coarser material, surely the chest and arms may be expected to do so. The fine shirt put on first, and carefully folded by the nurse, is not by any means necessary or desirable, and the time occupied in putting it on is all thrown away; but if a shirt is to be used at all, it must be fine, unless a new one is made every week or two; because in consequence of its not fitting, it must be creased, and, if coarse, the creases would certainly cause injury to the skin. The material is expensive, and therefore mothers are led to make the shirt of so large a size, that it will serve for about six months, so that at first it must necessarily be too large. Now, if a fine calico were made to fit, I would answer for it that no chafing would ensue; and the price is so trifling, that a new set once a month would be of no consequence, especially as there is very little make in this article of clothing. One great cause of mischief arises from the vanity and pride of the young mother, who is anxious to expose the neck and bosom of her child to those who come to look at it; and if she thought they could see so homely a material as calico, she would be dreadfully punished, and as a consequence the use of expensive under garments is continued. Such an exposure of the neck is most prejudicial, especially when it is recollected that at night the dress is drawn tightly up round the throat. Day-dresses and robes ought, by all means, to come as high, and many children suffer most severely from a neglect of this precaution. Short sleeves are also objectionable for a similar reason, and should not be allowed. With regard to ornament, of course it can do no harm; but its use should never be allowed to prevent the proper covering of the delicate limbs of the new-born babe. The only part which seems to bear exposure well is the head, and that until lately has been most carefully wrapped up in flannel caps with lace over them. It is now generally admitted, that infants thrive much better without them, and the disciples of this plan are yearly increasing in number. Long-clothes, reaching down far below the feet, are desirable for two reasons—first, because they prevent all danger of a draught of cold air up them; and, secondly, because they afford a pretty sure means of preventing any unfortunate escape out of the arms in tossing the young infant, which, without this precaution, has been known to occur. At this age there is absolute necessity for a napkin, without which the clothes would be constantly soiled. Some fine-lady nurses envelope this guard in oil-silk, so as to keep all the disagreeables within; but this is a most dangerous practice, from confining the wet, and it also leads to neglect, because the nurse is very apt to leave the napkin unchanged, if it does not by its external moisture lead her to make the renewal. With regard to a covering for the feet, it is usual, and a good practice, to put on them fine knitted shoes, which preserve them from cold, and are serviceable in that way; but they are not necessary at night. Out-of-door clothing is generally that on which the mother prides herself for its finery, and in this there is no great harm; but at the same time all that is required is such an amount of warm material as to guard against the lowering influence of the temperature of the external air. Hence it is that hoods and cloaks are used, and against them no one can have a word to utter, A light piece of worked cambric is also generally placed over the face for the same purpose, and in cold weather is almost an indispensable defence. At night the infant has nothing more than it requires, namely, a fine cotton night-dress, which would be the proper and sensible clothing for the day also, and beneath this the usual long flannel and barrow, together with the swathe. Besides these, when placed in the cot, there are the blankets and quilt to keep the child warm, and with these articles the list of mechanical means employed to keep up the natural heat of the body is exhausted. It is scarcely necessary to remark, that in fastening on the clothes pins are now almost entirely exploded, one only being used for the napkin, and that of a kind which prevents the possibility of injury.

994. IF THE MOTHER HAS NO MILK, or from any cause it is determined that she shall not nurse her child, it must either be brought up "by hand," or a "wet-nurse" must be provided; but in obtaining this assistance, there is often some difficulty, since there are not always mothers who have lost their babies, or who have milk and strength enough for two. But if such a person can be met with, and has plenty of good milk, the chance for the child is a much better one than if brought up by hand; for though the change may at first be prejudicial, yet that soon goes off, and at the end of a week, or less, the child takes to its new supply and thrives upon it well. When a wet-nurse cannot be obtained so as to entirely devote her milk to the child, it is often possible to share it between her own child and that for which it is sought for. In this way, three or four meals a day may be given to each, the intervals being filled up by artificial food, which should be as described at par. 272. But this plan is only advisable when the nurse has a great flush of milk, for otherwise both children will suffer, and the advantage to the foster-child will be wholly negatived. In such a case, however, the advice either of an experienced female, or of the medical attendant should always be taken.

995. DRY-NURSING, or bringing up by hand, is the alternative where neither the mother's milk nor that of a wet-nurse can be had. With reference to this plan, there can be only one opinion, namely, that it is an inferior substitute; but at the same time there can be no reasonable doubt that in a strong healthy child there is a good chance of rearing it upon artificial food. Many circumstances compel its adoption, such as poverty, or an insuperable objection to a wet-nurse; and therefore all that *can* be done *must* be done to render dry-nursing as little injurious to the child as possible. After the milk of the mother or a wet-nurse, the next material appears to be asses' milk, which comes very near to human milk in its composition, and therefore with a delicate child it is right, if possible, to adopt this food from an early age. Goat's milk also seems to agree with most babies in preference to cow's milk, and is largely used among the poorer classes; but as in many cases neither of these milks can be procured, and as cow's milk serves very well, it may be used in general; but it should at first be diluted with an equal quantity of warm water, and it should be slightly sweetened with loaf sugar. The temperature of the milk should be raised to about 75 or 80 degrees, and it should be given through the india-rubber nipple from the bottle alluded to at page 272. There is generally some difficulty in graduating the supply, which some infants can take only very slowly, so that if the hole in the nipple is large they are completely choked. It must therefore be selected for this early age with a small hole, and afterwards this may easily be enlarged with the point of a penknife. The mixture of different farinaceous materials with milk has always been extensively adopted, and I have known many young babies killed, or nearly so, by having thick messes pushed down their throats with a spoon, which could not possibly be digested. Sometimes, however, the milk causes purging, and then the addition of a little arrowroot or baked wheat-flour will often cause it to agree. Biscuit-powder is used

with the same intention, but either one of the above, or rice well boiled to a jelly, will be found to answer the best. At this age, as well as later, the system requires a mixture of nitrogenized as well as non-nitrogenized food, and therefore it is desirable to afford it in all cases. Milk is such a substance, and so is wheat-flour and biscuit-powder; while white sugar, arrowroot, rice, tapioca, semolina, and tous-les-mois are almost wholly deprived of nitrogen. All these last articles should therefore be given in union with milk, unless they are required only for a specific purpose, and are not intended to be used for many days—as, for instance, in the case of diarrhœa.

996. A Careful Washing of the young infant is all-important, for, without it, the skin soon inflames and becomes ulcerated. Warm water, at the temperature of the blood, or about 96 degrees, is the proper material; and, if used below this, it produces congestion in the internal organs, often followed by other mischief. After the nurse has put on *both* the flannel aprons devoted to this purpose, the whole body should be washed, beginning with the head and face, the former of which requires no soap, then drying that part before a good fire in a warm room, and proceeding to wash the arms and chest with soap, which parts should also be carefully dried. Lastly, the lower parts require an extra degree of care, rubbing the soap on the hand into the creases, and afterwards washing it all off with the water. When all is dry the outer apron is taken off, leaving the under one comparatively free from the water used in washing, after which the powder-puff is freely used over the whole body with some scented starch finely powdered, and usually known as "violet powder;" but great care should be taken to dry the folds of the skin with a soft towel before using it. It is better to dress the child in a separate room to the mother, because the heat required to keep the former warm during this process is too high for the health of the latter. The washing ought to be repeated at night, at all events of the lower parts of the body. With these precautions, the skin of a healthy child will generally remain sound.

997. Air and Exercise are of service even to the young infant, when the weather will permit; and, except in the depth of a severe winter, a turn in the open air ought always to be enjoined for an hour daily. In summer, two or three hours a day will do good, but half an hour at a time is enough to begin with. A little gentle tossing in the arms is desirable, also, in doors, but not so violently as is sometimes done. Nature has not intended the infant to have much exercise, its muscles and bones being imperfectly developed; and it is at this age more of the vegetable than the animal, carrying on its functions without any necessity for the muscular contractions of its extremities. Many people object to rocking the child in the cradle, but I cannot understand on what principle. It appears to be the instinctive means of soothing the child adopted by all mothers, when they have a child in their arms; and if proper at that time, an exactly similar process in the cradle cannot be objectionable. In theory, therefore, rocking is desirable, rather than otherwise, reasoning by analogy from nature to art; and in practice, I certainly have seen no ill effects from it; but, on the contrary, I believe it one of the greatest blessings to the nursery. There is no doubt that it has a wonderfully soothing power, and if it will produce sleep, it is a great boon at all times, but especially where the infant is at all out of sorts. Syrup of poppies is scarcely more potent in its effect; but, then, that horrible resource is used by those who cannot, or will not, be at the trouble of rocking the cradle. It should be remembered that rocking is the only kind of exercise which the baby can take, without being more or less distorted; for when held in the nurse's arms the pressure is so unequal that the frame must be drawn out of the straight line. For these reasons, therefore, I give my willing adhesion to rocking in the cradle, which I believe to be far less injurious

than rocking in the lap or in the arms.

998. THE CRYING OF A NEW-BORN CHILD appears to be a necessary part of its daily life, and I fully believe that those in which it is not exhibited are almost always out of health; its absence being generally accompanied by an unusual degree of stupor. Mothers should, therefore, make up their minds to hear their infant's lungs used in this way; and they should be satisfied that they *may* be used without mischief accompanying the display. There can be no doubt that the child cries when in pain; but the cry is very different from that sound which is given out when merely hungry or restless; and this difference should be studied by the nurse or mother, so that she may satisfy herself as to the cause; and when she finds that the crying is not from any feeling of uneasiness or pain, and knows that there is no disease of the lungs, or in the brain, or a rupture at the navel, she had better make up her mind to let her baby exercise its lungs in this way, which will afford comfort to the child, and will be followed by sound and natural sleep. Hundreds of children are kept restless from not being permitted to have their cry out, whilst if they can only get a good squall, they are happy and contented for twenty-four hours, or more. Any person who has tried the experiment, will see the difference between a pent-up and coddled child, and one whose lungs are allowed to expand in a natural way; and I am quite sure that every healthy infant is injured, if it is not indulged in a good fit of crying daily, or every other day. Every animal has some degree of nervous irritability, which can only be worked off by muscular action; and though the extent of this varies a great deal, yet it is shown to some extent even in the sloth and tortoise. In those animals which feed on flesh, it is very marked; and in the birds which feed on seeds, it is also highly developed, as in our singing birds confined in cages, where they hop from perch to perch for hours together, from a mere instinctive desire to lessen the feeling. So it is with young animals, they must frolic about in some way, or they are unhappy; and in the earliest stage of human existence, the only way in which it can be worked off, is by using the muscles of the chest in the active way which accompanies the squall of the child. If this view is correct, it is a cruelty to interfere with the action; and that it is so, I am as fully convinced as I am that a good walk or ride benefits ourselves, and that imprisonment within four narrow walls would be a cruelty to us. Only let the young mother look at it in this light, and try the experiment, and she will find that, in bodily health and comfort, her baby will be greatly improved, while in point of moral education the advantage of disregarding the cry, on account of its want of dangerous tendency, is still greater. The young infant, though apparently taking little notice, is as cunning as many older persons, and soon finds out that a cry will bring what is desired; hence this, the sole means of procuring it, is constantly called into play, and so the mother is terrified into granting whatever seems to be the wish of her child, whether right or wrong, simply because the cry for it is heard, and there is a fear that this cry, if prolonged, will cause an injury to some organ. In later years, this action indulged in till it becomes a disease has been known to cause even death; but no one ever heard of a young baby doing injury to itself by crying, unless at the time there was any absolute mischief going on in the lungs, or in the bowels, in which case crying would aggravate the mischief, and should be avoided by every possible means.

SECT. 2.—TREATMENT OF THE ACCIDENTS AND DISEASES INCIDENTAL TO NEW-BORN CHILDREN.

999. THE RATE OF MORTALITY among newly-born infants is so great that about one-quarter of all children born die during the first year of their lives, and a very large proportion of these within the first month. The accidents and diseases by which they are carried off are, for the most part, peculiar to their age, and have not,

therefore, been alluded to in the first part, and they are as follows:—

(a) Suspended respiration (still-born).
(b) Injuries during birth.
(c) Malformations.
(d) Heart disease (blue disease).
(e) Ruptures.
(f) Tongue-tye and hare-lip.
(g) Mother's marks (*nævi*).
(h) Nine-day fits (*trismus nascentium*).
(i) Erysipelas (St. Anthony's fire) and erythema.
(j) Purulent ophthalmia.
(k) Red-gum.
(l) Yellow-gum (jaundice).
(m) Skin-bound.
(n) Abscesses.
(o) Swelling of the breasts.
(p) Constipation, griping, and diarrhœa.
(q) Convulsions.

(a) MANY CHILDREN ARE BORN "STILL," that is to say, they do not begin to breathe as soon as born, and a still larger proportion than are now returned as born dead would be so, if some assistance was not afforded by the midwife. We are very much in the dark as to the cause of this suspension of respiration, but what we have here chiefly to consider is its establishment; still a knowledge of the reason why respiration does not commence as usual would probably assist us in our efforts, if we could obtain it. One very frequent cause is, no doubt, the existence of an unusual quantity of viscid mucus in the throat, by which the entrance of air is impeded; and this may readily be removed with the finger, by introducing it far back into the throat, and with the additional advantage of thereby irritating the top of the wind-pipe. If this does not suffice, a slight but sharp smack on the back will often put the inspiratory muscles in action, but if not, the mouth may at once be applied to that of the child, the finger and thumb pinching the nose, and a quantity of air may be forced into the lungs, which will expand the chest perceptibly. As soon as this is seen to take place, a very slight pressure on it may be made with the palm of the hand to force out the air, and then the mouth must again drive in some more air, the double process of inspiration and expiration being in this way imitated for some seconds, unless the child in the meantime breathes of its own accord. If the heart still pulsates, the navel string may be left attached, but if not it should at once be tied; and when the child looks blue and turgid with blood, the loss of a tea-spoonful of blood from the divided cord may be allowed before tying it, which will sometimes aid the object in view. While these attempts are being made, a hot bath should be prepared of a rather high temperature, viz., about 100 to 102° F., in which, as a last resource, the child may be placed; but it is quite useless to keep it in for more than three or four minutes, when, if it still continues in the same state of inanimation, there is no help, though friction before the fire with brandy may be tried for some little time. By some people the injection *per rectum* of half a tea-spoonful of spirit of turpentine in a little gruel has been advised, but I have tried it without success in so many cases that I have no faith in its efficacy when the above measures have failed.

(b) INJURIES are apt to occur during birth, either from some bony growth in the mother, or from the careless use of instruments, but these are not likely to exist without the presence of some person who will be able to afford what advice is necessary. They seldom are of any permanent importance, unless they are of such a nature as at once to destroy life.

(c) MALFORMATIONS are so numerous as almost to defy enumeration. The most common are—1st, an imperforate condition of the passages, which may be suspected when the *meconium* and water are not passed soon after birth, and which, if continued, should always call for a surgical examination; 2nd, an imperfect closing up of the lower part of the spinal canal, in which case there is a large soft and yielding bag of fluid there, the deformity obtaining the scientific name of *spina bifida;* 3rd, deformities in the limbs, such as club-feet, absence of fingers or toes, &c., and which are at once evident to the eye, and incapable of present relief.

(*d*) In some children the change, which is by nature usually accomplished at birth, is not effected, and the consequence is that only a portion, instead of the whole, of the blood is driven through the lungs in each round of the circulation. When this is the case the child is permanently blue or livid, and in the end generally dies, with symptoms of disease of the heart; but sometimes the opening gradually closes, and the circulation is thrown into its proper channel. When it exists little or nothing can be done, excepting that the child must be kept as free from crying as possible.

(*e*) **Many Children**, after the navel separates, which it does about the fifth to the seventh day, are troubled with a rupture at this part, to guard against which a band is worn for some time. One great cause for this is the awkwardness of the nurse in her washing operations, when there is no "binder" on the child, and when, as a consequence, any partial pressure on the contents of the abdomen has a tendency to force them out at any weak part, which the navel for a time is. The proper treatment for this kind of rupture is to take a slice off a wine-cork, and cut it to a point with a sharp knife; this is then to be covered with leather, and placed on a long slip of the same material, spread with soap-plaster; after which, by adapting the point to the navel, it may be buried in its hollow, and the ends of the plaster strained over the sides of the abdomen. The plaster requires renewing every ten days, or oftener, if it becomes loose before the expiration of that time. Should a rupture occur in the groin, nothing can be done for it until the child is large and strong enough to wear a steel truss.

(*f*) When the child has any difficulty in sucking, it may be suspected that the tongue is incapable of aiding that process, in consequence of its *frenum* being too short (see par. 531). If this is found to be really the case, a pair of blunt pointed scissors will readily divide the thin band, taking care only to cut its edge, and not to go down deeply to its root, where a large vein lies imbedded, and will give rise to great loss of blood if divided. **Hare Lip** (see par. 527) requires a surgical operation for its cure, which may be undertaken at a very early period after birth, in some cases, and in all should be shown to a surgeon as soon as possible.

(*g*) **Mother's Marks** are of every variety, from the mere spot or discoloration (par. 211) to the more important *nævus* (par. 415). In all cases, therefore, a surgeon should be consulted.

(*h*) **Nine-day Fits** are peculiar to this age, and are seldom met with in this country, except in hospitals where large numbers of children are collected together. They resemble epilepsy (see page 147) in their characteristics, and appear to be wholly beyond the influence of medicine.

(*i*) **Erysipelas** and **Erythema** are very apt to attack the new-born child (see page 59). It is necessary to be very careful as the one disease is highly dangerous, while the other is comparatively of little importance. Whatever may be the nature of the eruption, bathing with plenty of warm water will be of service, followed by a profuse application of the violet powder in ordinary use. If the inflammation is very high, and is attended with sloughing, poultices of linseed-meal may be applied, but in such cases, surgical aid is imperatively necessary, or fatal mischief may speedily ensue. Generally speaking, when there is erysipelas in the young infant, the strength requires supporting, and if the bowels are in pretty good order, half a grain of quinine may be given, dissolved in a little water, twice a day, or if the bowels are out of order, give the following powder, viz.:—

Powder of Ipecacuanha, gr. ⅛.
,, Rhubarb, gr. j.
,, Ginger, gr. ⅓.
Bicarbonate of soda, gr. ij. Mix.

(*j*) PURULENT OPHTHALMIA (par. 500) must be treated energetically, or the eye is almost sure to be lost. Wherever it may be possible to obtain the aid of a surgeon conversant with diseases of the eye, he should at once be called in; but when this cannot be done, a piece of the following ointment, of the size of a grain of wheat, should be introduced between the lids into the eye by means of a silver bodkin or probe:—

Take of nitrate of silver, gr. 10.
Solution of acetate of lead, drops 15.
Lard, 1 drachm.

Rub the nitrate of silver in a glass mortar until it is reduced to a *very fine* powder, then mix with the lard, and add the solution.

If the nitrate is not most carefully powdered, the grains are apt to *cause* ulceration of the cornea, rather than to remove it. This ointment is quite a specific in this form of ophthalmia, and I have used it in hundreds of cases without a failure, except where the ulceration of the cornea had previously gone almost to the stage of perforation. For those, however, who would be too timid to use so powerful a remedy, I would advise the application of a simple and cooling wash, as follows, inasmuch as there is no medium between the two extreme modes of treating this disease:—

Take of solution of acetate of lead, drachm $\frac{1}{2}$.
Water, ℥ij.

Mix, and use with a little piece of sponge or soft linen several times a day.

(*k*) RED-GUM (par. 201) is a mere symptom of some internal irritation, and in itself is of no consequence whatever. Unless, therefore, the child's bowels are disturbed, nothing need be done, and if they are, they will require attention, according to the state in which they are. (See page 268.)

(*l*) YELLOW GUM OR JAUNDICE almost always appears about the third day after birth, and is not then to be confounded with the more formidable disease described at page 101. The young mother need not therefore be alarmed, if about the above-mentioned time her child loses its former red colour, and becomes as yellow as a guinea. Of the cause of this change of colour we know little or nothing, and can only conjecture that it is in some way connected with the new office which the liver now has to perform. Hitherto there has been no digestion of food, and though the liver has been concerned in purifying the blood as it comes from the mother, yet it has had a comparatively easy task, and has not been called upon to act upon the fatty matters contained in milk, nor has it to supply the healthy stimulus to the intestines afforded by the bile. It is not, therefore, surprising that its machinery should at first be slightly disinclined to act, and that the bile should overflow its vessels, and become thrown out of them into the skin. If the *meconium* has been all worked off, and is replaced by motions of a healthy yellow colour, no notice need be taken, and the yellow gum will disappear in a day or two; but if this is not the case, and the motions are still dark, or if they are quite white, a drop or two of castor-oil may be tried in a little sugar, or perhaps four grains of rhubarb and magnesia may be given instead.

(*m*) CHILDREN SELDOM BECOME SKIN-BOUND except in hospitals or workhouses, where it appears to be caused by bad air and improper food, united with the peculiar effects of over-crowding. Few children affected with it survive, unless they are at once removed into the country, and are supplied with a wet nurse of good quality.

(*n*) ABSCESSES sometimes occur in young children, and may be known by the sensation of "fluctuation," which they give to the fingers. When this is felt the matter should be let out with the lancet, as they are otherwise very apt to increase to an enormous size before they break of themselves.

(*o*) THE BREASTS IN BOTH SEXES OFTEN SWELL and contain milk; and if they are pressed or irritated, matter will very often form in them. The best application is a bit of leather, spread with soap plaster, which effectually guards them against friction.

(*p*) THE BOWELS OF CHILDREN are very apt to be either too costive or too much relaxed, and they are sadly tormented with wind. It may be said that, if left to themselves, all this would right itself, and so it would if the milk and other food could be always obtained of a healthy character, either from the mother or the cow. As, however, this is not the case, we must endeavour to remove the ill consequences attendant upon its improper nature. Very often mischief is done by feeding young children with food which they cannot digest, that is to say, by giving them more than their mother's milk; or if spoon-fed, by mixing with the cow's milk flour or oatmeal, or biscuit, all of which are unfit for the tender mucous membrane of the young infant. If, however, in spite of attention to feeding, the bowels continue to be moved more than three or four times a day, which is not too often at this age, the following may be given:—

Take of Prepared chalk, gr. xx.
,, Aromatic confection, gr. vj.
,, Syrup of poppies, ʒj.
,, Powdered gum arabic, gr. x.
,, Water, ℥iss.

Mix, and give a tea-spoonful after each slimy motion. Where the bowels are COSTIVE at this early age, a little castor-oil is the best remedy, of which from a mere spot to half a tea-spoonful should be given in a little brown sugar. Beyond this remedy, or one or two others quite as simple, it is never right to administer medicine to the baby without the sanction of a proper and competent authority, as the complications are so great, and so difficult to detect, that neither mother nor nurse is likely to make them out. But as far as castor-oil, or magnesia, or rhubarb-and-magnesia are concerned, there can be little harm done; and, if there is merely costiveness, without defective action of the liver, these will suffice. An ounce or two of warm water thrown up the bowel with a syringe, or a piece of soap passed for about an inch, will often cause the bowels to act, and should be tried prior to having recourse to medicine. It is usual for new-born infants to average about two or three motions a day; but one, if copious, and of a good colour, will be sufficient; and three, or even four, need cause no alarm, if unaccompanied by a discharge of mucus or by griping. When the infant is evidently suffering from WIND, there is nothing better than dill-water, of which from half to a whole tea-spoonful may be given in a little warm water.

(*q*) CONVULSIONS do not very often occur in the first month, except in the form described at (*h*). Sometimes, however, from improper food, they make their appearance, and then the best remedy is half a tea-spoonful of castor-oil with an equal quantity of dill-water. The warm bath may also be used for four or five minutes with safety, but beyond that time it is not prudent to continue it.

CHAP. III.

ON THE TREATMENT IN HEALTH AND DISEASE OF THE INFANT, FROM THE END OF THE MONTH TO THE END OF THE SECOND YEAR.

SECT. 1.—MANAGEMENT IN HEALTH.

1000. THE WASHING AND DRESSING of the infant after "the month," is the same as that described at page 275, until it is some five or six months old, when the water may gradually be reduced in temperature, and it is no longer necessary to dry each part separately. Cold water is adopted at the end of the second or third month by some managers; but in opposition to most medical authorities, and certainly inconsistently with my own experience. It is true that children survive its use, and no one maintains that it inevitably kills; but the question is, which plan is the better calculated to ensure a healthy frame? and here I believe the answer will be in the long run in favour of tepid water. In all cases, however, before weaning some little modification is required from the process described as necessary for the young and new-born infant. There is, no doubt, a great difference of opinion as to the time of beginning to use *cold* water for babies; and I believe it must vary, or at least ought to do so, according to the constitution of the child, as inherited from its parents. The same rule applies here as to bathing generally. If reaction occurs, cold-bathing does good; but in some infants it cannot be produced, and the child remains cold after being dipped, until warmed before the fire. To such a constitution cold-bathing, I am satisfied, is unfitted, and often produces congestion or inflammation of the lungs. It is very common to see children who are regularly bathed in cold water with a fixed and mottled colour in their cheeks; now this is not a sign of health, but rather of a congestive tendency, and many such children are rarely long free from some complaint of that kind. Whenever the child turns blue, and *remains* so, it may be considered that cold water is disadvantageous; and, on the other hand, if the skin rapidly becomes red and warm, the contact of cold water is not only not injurious, but is actually attended with an increase of health and spirits. There are, however, different degrees of cold, and much depends upon the source from which the water is obtained. Cold water for children should never be lower in temperature than 45 or 50 degrees; and to obtain this in the winter, a proportion of hot water must generally be added, unless it is drawn from a very deep well, and used almost immediately. With regard to the use of soap, no difference need be observed.

1001. THE FEEDING OF THE INFANT brought up "by hand" is not changed from the mode described at page 274, for the first few months; but as the child increases in strength, the quantity and quality are increased and raised, while the periods between the meals are lengthened. Milk of some kind is, until the teeth appear, the staple of the food; and it is, no doubt, the best article we possess for the purpose. Ignorant people fancy that it disagrees, because it always is turned into a curd; and I have frequently known the attempt made to rear a child upon water arrowroot with sugar only, but with a result which convinced the nurse that this kind of diet could not even keep the child alive. Bread or flour boiled in water, or biscuit-powder boiled in a similar way, till quite tender, or rusks, or tops and bottoms, all of which are prepared from wheat-flour, will suffice without milk in some cases, when the child is very strong; but though they keep the child alive, they do not afford that healthy tone which the natural food alone gives. They are deficient in saline matter, and should never be allowed for any length of time without a little milk, or, what is better, cream and water added to them. Much depends upon the condition of the child's bowels, which may be very costive, and then will bear oatmeal; or very relaxed, in which state the arrowroot, rice, or boiled flour must be exhibited. But until the infant is a month old, it will seldom be desirable or necessary to go beyond cow's milk and water with sugar, though many strong children seem to do better, even before this age, with a slight addition of one or other of the above-mentioned ingredients. Gradually the quantity of thickening material may be increased; but it is better to err on the side of caution, and protract the change a little longer, rather than begin to give the child more stimulating food than its stomach will bear. The milk may also be used in large proportion, especially in London, where, at the best, it is but milk and water; but in the country also many children, after the second or third month, will bear food made of genuine milk, thickened with one or other of the articles suited to the case. Bullock's semola is the gluten of wheat-flour deprived of its starch; but I cannot, in theory, see the use of this material, nor, in practice, have I found it answer. If it is to be mixed with milk, it is unnecessary, because milk already by nature is full of nitrogen; and if it is not to be used with milk, it must be mixed with starch in some form, in which case it is only re-united to that which has been taken from it by an expensive process. Baked wheat-flour is this gluten with the addition of starch, so that it embodies all that is wanted, and is, I believe, the most scientific, as well as the most practically useful of all food for infants, always excepting milk. But because it is cheap, it is neglected; and the very same article, under the name of farinaceous food (Hard's or any other person's) is purchased at four or five times the price; and though none the better, yet fancy clothes it with some wonderful advantages. It is well known that all these foods are really wheat-flour, and in most cases nothing else, and yet people will be gulled into giving an absurd price for them, rejecting all the time a good article because it is offered to them in its natural form and *name*, and at a proper market price. When there is a great tendency to form fat, I believe Bullock's semola may be advantageously used; but these cases are very rare indeed, and are scarcely worth consideration; nor would Mr. Bullock manufacture the article if he were dependent solely upon this state for a sale. Sometimes, in very delicate children, a little isinglass may be dissolved and added to the food with advantage; but, generally speaking, the milk of the cow, with the addition in some cases of *small* quantities of one or other of the above-named materials, is quite sufficiently supporting up to the sixth month, after which the management will require a slight alteration, as will be described in the next paragraphs. It may be remarked, that from the second to the sixth month the periods of feeding, whether by suckling or from the bottle, should be gradually lengthened, so that by the last-named time a meal every four hours will suffice. As the times of feeding diminish in frequency, while the whole amount of food required daily is increased, so the quantity given at a meal must be gradually augmented, and by the sixth month, the child will often take nearly a bottleful of food. Indeed, in some cases, I have known a good-sized bottle taken every four hours before the sixth month, but this is certainly above the average.

1002. WEANING IS NECESSARY at some age, inasmuch as the child cannot always live upon its mother's milk; nine months is about the average, but the best guide is the nature of the milk, joined to the strength of the child and its progress in teething. If the milk is becoming poor, it is much worse than cow's milk, and many children are half starved because their mothers persist in feeding them upon a poor watery fluid, which is not only devoid of nourishment, but is actually prejudicial, from its tendency to produce irritation of the lining membrane of the stomach and bowels. Human milk, like cow's milk, varies greatly in the proportion of its constituents, and many samples are almost wholly deficient in cream, but very rich in curd, so that the child's stomach has a great deal to do in order to effect their digestion. Hence it is that we so often see a portion rejected by "puking," which act, from its frequency, is called a natural process, though, I believe, wholly without foundation. A strong, healthy child fed on milk, produced without the stimulus of porter or gin, will keep it on its stomach, with very rare exceptions; and it is only when the curd is excessive, or when the milk is otherwise indigestible, or when the stomach is naturally weak, that a part of the curd, produced by the gastric fluid in all cases, is rejected. Supposing, therefore, that the milk is scanty, or of bad quality, weaning is desirable for the sake of the child, while, for the mother's sake, it must be adopted. If, however, the time can be selected, that is to say, if the milk is good, and the mother and child both healthy, it may well be deferred until the teething is in great measure completed, which is on the average about the fourteenth month. Whenever it is decided upon it will be necessary to separate the nurse and child, whether suckled by the mother or a substitute, because the constant pining for the breast is increased, to a great extent, by the sight of its possessor; while in her absence the child is much more contented, and will take the bottle and go to sleep in comparative ease and comfort. When the nurse has to wean the child without any assistance, it is generally a very troublesome affair, and often takes a long time and many struggles before it is accomplished. Many mothers go on a long while suckling their babies at night and feeding them by day; but I do not believe that they thrive so well upon milk, which has been pent up for twelve hours at least, and often for a much longer time. Still, as it is very difficult in some cases to quiet a child at night without this resource, it is done, and will be, I have no doubt, in spite of its prejudicial character, even if fully proved, which it is not. Almost all children are *partly* fed upon cow's milk and oatmeal, or flour, before they are weaned, and only require the extra allowance of that particular kind which has been found to suit them best. By this age biscuit-powder, or tops and bottoms, or rusks, will generally agree better than oatmeal-gruel, or milk thickened with flour. In many cases, however, oatmeal seems to suit to a much later age; and when it can be procured *fresh ground and quite sweet*, it is a most valuable kind of diet; but, as sold in this country, it is constantly mixed with barley-meal, and kept, also, till it is sour, so that it is no wonder that it should be considered heating, a quality which is exactly opposed to the effects of the genuine meal, and which is mainly due to its admixture with barley-meal, and to its having become sour.

1003. THE FOLLOWING ARTICLES OF FOOD are suited to babies from the age of three or four months to the end of the second year; and they may be used either for those entirely brought up by hand, or in conjunction with the mother's or nurse's milk if it is too poor or too scanty to afford sufficient support.

(*a*) OATMEAL-GRUEL is made either with prepared groats (Robinson's are the best) or with the old-fashioned Embden groats, or with English fine oatmeal, or with Scotch meal. For young infants the prepared groats are the best, as they are ground very fine; and I fancy they are mixed with wheat-flour, which renders them less inclined, to gripe and purge. The directions for making the gruel with them are to mix up a tea-spoonful of the meal with a little cold water, and then stir boiling water into this, after which it requires boiling for a quarter of an hour, and should then be strained, if lumpy, and mixed with an equal quantity of milk. Embden groats must be boiled slowly for two or three hours at least, in order to get out all their nutritive matter. The English or Scotch oatmeal is used like Robinson's groats, but the latter being coarsely ground requires a longer boiling, after which it makes an admirable article of diet.

(*b*) RAW OR BAKED WHEAT FLOUR, or any of the farinaceous foods sold as Hard's, &c., should be mixed up smoothly with cold water, and then after having boiling water poured upon them, they require about ten minutes' simmering, upon which they thicken, and require reduction with milk.

(*c*) BISCUIT-POWDER, TOPS AND BOTTOMS, AND RUSKS.—Boil either in water for a quarter of an hour, which must be strained off after letting it settle; then rub it through a sieve, and add some good milk to the pap before using it. For a small panakin, a tea-spoonful of powder will be sufficient.

(*d*) ARROWROOT.—Mix a small tea-spoonful of arrowroot with cold water, as for starch; pour on this boiling water, stirring all the time, and if it does not thicken, put it on the fire for a few seconds until it does. Make it thin and cool by adding cold milk. If the infant is weaned, the arrowroot may be made entirely with milk. This food will not suit every infant, being in some cases too constipating.

(*e*) PEARL SAGO AND SEMOLINA boiled well in milk, make a very light and nutritious food for infants.

(*f*) BARLEY GRUEL of pearl barley, mixed with milk, suits some children; or made with the prepared barley sold as Robinson's; but for most children, barley in any shape is too heating.

(*g*) A GOOD SUBSTITUTE FOR THE MOTHER'S MILK in delicate children is made by mixing one-third of cow's milk with two thirds of mutton-broth or beef-tea, made according to the following directions, and sweetening it with white sugar.

(*h*) BEEF-TEA OR MUTTON-BROTH for an infant is made without spice, and with very little salt. Let a quarter of a pound of lean beef or mutton, as the case may be, be cut into small pieces; put it into a basin, and pour over it half a pint of warm (not boiling) water; cover the basin, and let it stand for half an hour near the fire; then put the contents of the basin into a clean saucepan, and set it on the fire to boil. When it boils, skim it well and cover the saucepan; draw it off the fire, but let it simmer gently for an hour. Strain through a tammy sieve into a basin, and put it into a cool place till wanted for use. In cool weather it will keep a day or two, but in hot it must be made every day.

(*i*) RICE GRUEL (*useful in cases of relaxed bowels*).—Wash and boil a quarter of a pound of rice in a quart of water for three or four hours. Strain the gruel away from the rice, and put it in a cool place. When wanted for use, take half a panakin of it, and warm it with an equal quantity of milk. Add a little sugar.

(*j*) THE SUGAR for the above receipts should be white when the bowels are not confined, and brown when at all inclined that way. When very constipated, treacle may be had recourse to.

(*k*) BREAD-AND-MILK rarely agrees with babies until they are fifteen or twenty months old, and have been weaned some time. The bread should be stale, and of a fine but pure quality. It should be broken or cut in small pieces, and then boiled in water for ten minutes, after which good new milk may be poured upon it in an equal quantity, and then the whole just boiled up. If the milk is poor, the water should be poured off before adding it.

(*l*) GOOD GELATINE OR ISINGLASS may be added to any of the above diets, excepting, of course, beef tea or mutton broth, which do not require it. Hartshorn shavings were formerly used for the purpose, but they are only serviceable from the gelatine they contain, and are therefore now superseded by the finer qualities of gelatine as sold in the shops.

(*m*) CUP OR BREAD PUDDING.—Grate some stale bread into a teacup, pour boiling milk over it, and when cold mix with it the yolk of an egg. Boil it in the cup for a quarter of an hour. This is an excellent baby's pudding.

(*n*) ANOTHER BABY'S PUDDING.—Take a teaspoonful of flour, and mix it very smooth with a tea-cupful of new milk. Beat the yolk of an egg, and mix it thoroughly with the above. Put it into a tea-cup, and tie it up in a pudding cloth, and boil it a quarter of an hour, if the fire be very brisk; otherwise, twenty minutes.

(*o*) RICE PUDDING.—Rice steeped in milk for several hours, in the proportion of a dessert-spoonful to half a pint of milk, and then boiled, is a palatable and nutritious pudding for children from ten months to two years old.

(*p*) ARROWROOT PUDDING is made by mixing the arrowroot with cold milk, and adding the yolk of an egg. It should be boiled a quarter of an hour.

(*q*) STEWED MEAT FOR WEAK STOMACHS.—When it is an object to give young children meat, and yet they do not digest it, proceed to cook it by stewing one pound each of beef and mutton cut in slices across the grain of the meat, with one carrot, one turnip, and one small onion for eight hours in three quarts of water, and season with salt and a very little pepper or pimento. Then take out what is left of the vegetables, and give about half a teacupful of the meat with the gravy, which together form rather a thick mess. From the long boiling of the meat, and its being cut across the grain, it is divided completely, and is free from long fibres, so that the weakest stomach digests it, if it will bear animal food in any form.

1004. AIR AND EXERCISE are, next to good and proper food, necessary to the child at this period of its growth; but the quality of the former, which is accessible out of doors, must mainly guide the nurse in deciding on the time during which the children are to be submitted to it. In the summer and in the warm and dry days of spring and autumn, it is scarcely possible to over-do the child in this respect—that is, so long as it is protected from over-fatigue by some kind of carriage. The influence of light and sun on the colour of the skin is very remarkable, and appears to be closely connected with a state of rude health. The term, "sun-burnt," is that popularly used to express the condition following exposure to the sun, in which there is a brown deposit under the cuticle, together with, in general, a greater amount of blood circulating in the skin. What the nature of the change is which produces this colour has not been established, but it appears to be connected with certain rays of the sun which are neither luminous nor heat-producing. But setting theory aside, experiment has shown that light exercises a marked influence in the development of animals—the tadpole does not become the frog if kept in the dark, nor does the insect go through its several stages. It is very rare to see a deformed gipsy or American savage, although they are exposed to all the variations of the seasons; while, on the other hand, in the cellars of Liverpool and Manchester hundreds of cases of deformity may be met with in their most hideous aspects. Hence in all cases plenty of fresh air and light, with a proportion of exercise suited to the age, should be provided for the young child.

1005. THE SLEEP REQUIRED at this age amounts at first to considerably more than half the full period of life, gradually coming down to about that proportion of time. Young babies, if in health, sleep very quietly and soundly, and "go off" almost as soon as they are fed, which they should be suffered to do at all times, if inclined, putting them into their cradles at once, and not lulling them to sleep on the lap. But they should not be compelled to sleep, and may always be allowed to stretch themselves on the lap, if so disposed.

SECT. 2.—DISEASES PECULIAR TO THIS AGE.

1006. Although the child at this period of its existence is liable to a great number of diseases, yet there are only two which are peculiar to it, viz., those connected with *teething* and those produced by the change of food in *weaning*. All others are much the same as in the older child, though somewhat modified by age.

SUB-SECT. A.—THE DISEASES CONNECTED WITH DENTITION.

1007. THE FORMATION AND STRUCTURE of the teeth has been alluded to at pages 92, 93, where it is explained that they are secreted from the mucous membrane of the jaw, being included within the gum some time before birth, and at that time being always in existence, but concealed beneath the gum.

As they increase in size, they are gradually protruded, and the whole of this first set generally make their appearance before or soon after the end of the second year. The following is the usual order in which they show themselves, though in this there is great irregularity, some children not beginning to cut their teeth until the beginning or middle of their second year, and in rare instances none at all being formed through life. The first set, or milk teeth, consist of—

4	central incisors, cut at	6	months.
4	lateral incisors, ,,	8½	,,
4	anterior molars, ,,	14	,,
4	cuspidati or canines,	17	,,
4	posterior molars ,,	30	,,
20			

At birth the incisors have their crowns completely formed, while those of the molars are in a forward state of progress. From this time the roots gradually elongate, and as they have no room to grow downwards, they protrude the teeth through the gum. This process must occur in all children, and when they are quite robust and healthy, it takes place with little or no constitutional disturbance; but almost always about the time that the teeth first show themselves the child loses flesh, and is slightly inclined to be feverish. Saliva flows in larger quantities than usual in almost every case, and is of a glutinous consistence, so as to hang in strings from the mouth. There is, in fact, an unusual supply or determination of blood to the jaw, as always happens when a new growth is taking place.

1008. But when there is an unusual degree of irritability in the nervous system, as is generally the case in delicate children, we almost invariably have more or less disturbance of the brain and nerves, or of the stomach and bowels, or sometimes of both these systems conjointly. It is too much the custom, perhaps, among mothers, nurses, and doctors, to assign "teething" as the cause of almost every complaint which occurs at this age, but still there can be no doubt that it has to answer for many of them. It must be remembered, that in the first place the mere act of formation calls upon the system for a large supply of material, but then this is constantly going on from the period of birth, and is not confined to the time when the teeth are thrust through the gums, which marks the approaching completion of the task; and, consequently, it is hardly logical to attribute any feverishness of *short duration* to a cause which exists during the whole of the first two years.

1009. THE SYMPTOMS OF IRRITATION from teething are generally severe in proportion to the rapidity of the development of the teeth, and in most cases, the earlier the time at which the teeth show themselves, the more marked is the sympathetic affection of the system. They may be divided into three sets—1st, those affecting the *brain and nervous system;* 2nd, those connected with the *stomach and bowels;* and 3rd, those of the *skin.*

(a) THE HEAD IS AFFECTED in teething, partly from the irritation produced upon the nerves which supply the teeth and gums, and partly from the increased quantity of blood which flows to the head in common with the jaws, which primarily attract it. At this period of life also, the brain grows rapidly, and, independently of the teeth, is supplied with a larger quantity of blood in proportion to the body than at later stages of existence. Thus, we frequently find the baby's head hot, the cheeks red and swollen, and the eyes suffused and watery. With this there is always more or less feverishness, marked by heat of skin, thirst, restlessness, scanty urine, and often confined bowels, which together constitute what is called "the teething fever" of nurses. At other times, without any perceptible fever (but almost always preceded by tension of the gums), there is a general convulsion of the body, which may be followed by others at longer or shorter intervals. These convulsions or fits are sometimes merely spasmodic actions of the muscles of the face or arms, and are then not of such importance as if they were general. A permanent contraction of

the flexor muscles of the thumb, in which it is drawn closely in to the palm of the hand, is a common symptom, and usually a fatal one.

(*b*) WHEN THE STOMACH AND BOWELS are sympathetically affected, there is either obstinate constipation, generally accompanied by a torpidity of the liver, or there is a continued and very troublesome diarrhœa. In this latter case the stools are green and slimy, but as the child does not refuse its food, the loss of flesh and strength is not very perceptible.

(*c*) "TOOTH-RASHES" are constantly occurring about the time of teething, and vary a good deal in character, being sometimes merely papular (par. 201), at others there is erythema (par. 171), or eczema (par. 181). They are, however, generally of little importance, and may be left to nature, as they disappear when the teeth are all cut.

1010. THE TREATMENT of these several affections must always be influenced by the amount of mischief going on, and by the strength or debility of the child. If diarrhœa is present, it should be left to take its course, unless it is very urgent, and the child loses flesh, when it may be necessary to check it, in the most cautious manner, by means of chalk united with carminatives (see *astringents*, par. 975). On the other hand, constipation should never be allowed, and the state of the liver should be regulated by the administration of ipecacuanha and rhubarb (see *aperients*, page 268); or, if this fails, by the substitution of a little gray powder for the ipecacuanha as there ordered. When the head is much flushed, with a good deal of feverishness, it is generally prudent to give a mild aperient, consisting of twenty grains of tartrate of potash, in a little sweetened water; or, if this is not sufficient, one of the fever mixtures given at page 269. If the gums are very much swollen, and feel hard and full, the use of the gum lancet may be beneficial—first, from the loss of blood which is thereby caused, and, secondly, by the relief which it affords to the system, by liberating the tooth from its confinement, and thereby aiding nature in her operation, which she was hardly able to perform by herself. For fits lancing is almost always necessary, together with the use of the warm bath, for five minutes, and sometimes, in addition, a leech must be applied to the temple, but this should not be done except in strong and plethoric children, as it sometimes happens that convulsions are produced by weakness, in which case the loss of blood would be prejudicial. Blisters are of doubtful advantage in such cases, as they are apt to aggravate the mischief *at first*, though they afterwards afford considerable relief. An aperient may generally be given, except when the bowels are already relaxed, and the child is much reduced in strength. In the stage of weakness following the evolution of the teeth, good strengthening food should be given, consisting of chicken-broth or beef-tea, &c., and half a grain of quinine may be given two or three times a day, dissolved in water; or, in very pale and emaciated children, the citrate of quinine and iron may be substituted in the dose of one grain twice a day.

SUB-SECT. B.—EFFECTS OF CARELESS WEANING.

1011. IF WEANING is conducted with care, and if it is postponed to a sufficiently late period, the child does not suffer to any serious extent from the loss of its mother's or nurse's milk; but when it is suddenly deprived of it at a time when it is most wanted, namely—when the teeth are being developed, there is often great constitutional disturbance, and the stomach is also so much upset as to refuse to digest any other food. It is never desirable to leave off "the breast" without having previously fed the child partially, and then the change being made gradually, there is not much disturbance of the functions. There is, nevertheless, almost always a loss of flesh at this time, unless the milk has been of a bad quality, and then it sometimes happens that flesh is gained rather than lost. If there is much diarrhœa, it must be checked by the use of a tea-spoonful of chalk-mixture and two or three grains of aromatic confection; while, if there is reason to apprehend that the food is irritating the bowels, a mild dose of rhubarb and magnesia may be given with advantage. The great point is, when weaning appears to irritate the bowels, to avoid giving food which is of too strong a nature, and to keep, as far as possible, to cow's milk, reduced with water, if too rich, and sweetened with white or brown sugar according to the state of the bowels. It may be thickened with arrowroot or baked wheat flour in diarrhœa, or oatmeal may be boiled in it if the bowels are at all costive. In any case it may be remembered that the bad effects of weaning are caused by improper food, and that they may almost always be relieved by a change in the food, and consequently medicine is rarely required.

CHAP. IV.

MANAGEMENT OF THE HEALTHY CHILD AFTER THE SECOND YEAR.

SECT. 1.—GENERAL REMARKS.

1012. In the present chapter we have to consider the child in its several stages, as it advances from the "toddling infant" to boyhood or girlhood. As it grows in body, the mind is also unceasingly occupied in taking in impressions, and comparing them with each other. Everything it sees is a source of wonder and of admiration or dislike, both of which are vividly expressed at this age, and apparently without any just cause. Thus, a fragment of brick, or some other piece of rubbish, which is to us quite valueless, will often occasion more pleasure to the child than the most costly toy; while no expense or trouble will always ensure a grateful appreciation of the efforts which have been made to produce a smile of welcome. There is a remarkable capability of happiness at this age, and also a complete dependence for its enjoyment upon some one or two persons, who have the confidence of the child, and who are considered omnipotent by him. Now is the time when impressions for good or evil are made, never to be wholly effaced; and, hence, the utmost care should be taken that harm is not done, and that what evil passions may be in excess should be diligently curbed and counteracted by judicious training. It is absurd to say that all are born alike, or that in childhood boys and girls are the same, and are only altered in character by external circumstances. The brain itself is larger at birth in the boy than in the girl; while the whole body of the former averages 7.05 lb., and that of the latter 6.41 lb. This material difference is accompanied by a corresponding variation in habits and feelings. The boy almost invariably prefers a sword, a stick, a drum, or a trumpet, while the girl chooses a doll, or some substitute for in the shape of a ribbon, or a handkerchief. The mother or nurse, who has a whole little family to manage, always complains of "the boys," and finds little difficulty in exercising a due influence on her female children, who are sharper, quicker in imitation, more gentle and submissive, than the brothers, and require altogether a different style of management. Besides these distinguishing marks peculiar to the sexes, there is also an immense congenital variety in the natural individual characters of the members of each sex. Take a large family of children born in succeeding years, and equally healthy, managed by the same mother and nurse, and in every way submitted to the same external circumstances; yet how various the tempers and dispositions, and how necessarily varied also their successful management must be. Much may no doubt be done to subdue evil tendencies, and call forth those which are good; but every one who has watched the development of the mind of the child must see that it is not a blank sheet of paper which receives all its ideas from without, and each of them exactly in the same way. In one child, the sight of a fly on the window-pane excites a desire to destroy or injure it; while in another, the wish is to cherish, pet, and preserve it from harm. All children have a propensity to destroy their toys, but not in an equal degree, nor from the same motive, which is sometimes the prompting of an inquisitive mind, and in others the mere love of destruction, to which the phrenologists apply the name destructiveness. From a full persuasion of the truth of these assertions, I am convinced that the theoretical groundwork of phrenology is correct, and that the faculties grouped together by them are called forth with various degrees of power in the youngest child; but when it is attempted to connect these principles with the external form of the brain, the science is converted into charlatanism, and for this reason has failed in long keeping possession of the public mind. If true, it would be of the greatest service in education; not because it would permit of the external compression, or other treatment, of the organs in excess, but because it would enable the nurse, or teacher, to know that beforehand which she now only learns by experience, and at a time when considerable mischief may have been done from a mistake in the discrimination of character. With these remarks on the nature of the machine to be treated, it is now necessary to proceed to its superintendence.

SECT. 2.—WASHING AND DRESSING.

1013. THE WASHING AND DRESSING, from the end of the second year to the time of going to school, varies very little in its nature. It must still be carried out by the nurse, who will use her discretion, if she has no other orders, as to the use of warm or cold water in winter. During the summer, all children at this age bear cold water, and plenty of it; and even in the winter some of those whose circulation is very active are able to bear up against the chill produced by its use; and if so, they are rendered much more hardy, and are less susceptible of the influences of those rapid alternations of heat and cold, dryness, and moisture, which we all have to endure in this country. But if the circulation of the skin is so delicate as to refuse to produce reaction, cold water does a great deal of harm in the winter, and should then be replaced by tepid bathing, or even absolute warm water at a temperature of 80 degs. Fahrenheit. Many children are sacrificed to the well intended efforts of their parents to make them hardy; but I have not the slightest doubt, that in this particular, as in most others, the treatment must be proportioned to the peculiarity in each constitution. After four or five years of age, however, when children begin to wash themselves, they may be encouraged to sponge themselves all over every morning instead of the entire plunge in the bath. This braces and cleanses the skin, without reducing the temperature too much in cold weather, and is preferable for children, who will otherwise dabble too long in the water, and thus do absolute injury to themselves by carrying to excess what is otherwise a most valuable adjunct to health. Baths, as remedies to disease, will come under notice in the next chapter.

SECT. 3.—CLOTHING.

1014. THE CLOTHING is not made very different in principle from that introduced after short-coating, except in the article drawers, which boys, and girls too, now begin to require. From the shortness of the frocks and petticoats which are used for both sexes, the lower limbs are constantly exposed to the cold air in the house as well as out, and for this reason drawers are indispensably necessary to the comfort and health of the children. They may be made very short, and in the girl are ornamented to the heart's content of the mamma; but this can do no harm, and may be indulged in without injury to health. When children take out-of-door exercise, it is now customary to enclose their legs in warm woollen gaiters, reaching from the knee, or even higher, to the foot; and this plan has oeen the means of saving thousands from disease and death. Many a child has been killed in "hardening" it, and many a one will yet suffer from that fatal mistake. The scientific farmer finds out by experience that, if his young stock are to be of good form and healthy constitution, they must be kept warm and dry; and, therefore, he spares no expense in protecting them from the keen winter air and the rains of heaven. But the cleverer (?) mamma, especially if she fancies that she has a little knowledge of the subject, exposes her children in order to render them hardy, forgetting, or not having discovered, that the very exposure nips the frame, and prevents its being developed into a condition which can resist external influences. Some children are never allowed to warm themselves, and are cold from Michaelmas to Lady-day, or thereabouts—the consequence being that the chest is narrow, the abdomen large, the hands and legs blue and covered with chaps and chilblains, and the face mottled blue, red, and yellow. The blue colour is from the congestion in the veins caused by the cold, the red from the inflammation established to get rid of this, and the yellow from the defective action of the liver caused by this chilling of the surface. By all means give children as much air and exercise as they can take in all weathers but actual rain or snow; but when at rest, let them be like the farmer's young stock, in a comfortable and *warm* apartment. Ventilate this well, but in the ventilation take care that the temperature is not so reduced as to chill the tender skin of the child; and in proportion to the warmth of the room let the clothing in doors be regulated. Whatever the means may be, avoid a cold skin, which in childhood is the harbinger of all sorts of mischief. The simple remedy is a good fire joined to Arnott's ventilator, &c., as already described at page 8, but if these costly luxuries cannot be afforded, then the cheap substitute of warm, long, woollen mittens and worsted stockings may be introduced, with the knowledge that they are not by any means inefficient. Here, as in every other department, there is every variety in the power of generating heat, and the clothing or temperature which will suit one child will be too hot or too cold for another; so that no single rule can be applied to all, excepting the simple one mentioned above, and easily carried out by the nurse or mother occasionally feeling the skin of the legs and arms of her charge; when, if they are too cold or too hot, some change ought to be made, if justice is to be done to the natural health of the individual.

SECT. 4.—DIET.

1015. THE FOOD SUITED TO THE INHABITANTS OF THE NURSERY will vary now considerably from that adapted for the infant; and is, in fact, a sort of modification of that which the adult enjoys. A regular breakfast, dinner, and tea must be established; and to the young children a slight break must sometimes be given at other times, but only in the shape of a bit of bread and butter, after morning and afternoon exercise, when the children would often be too hungry to sleep, if left without food until dinner. The hours for these meals may be—for breakfast, 8 o'clock in summer and 9 in winter; dinner, 1 or 1.30; and tea, 5 or 6; which meal will last until bed-time, at 7.30 or 8 p.m. These meals suffice for all strong children more than five years of age; but, prior to that period of life, the stomach will hardly last so long as five hours from meal to meal; and, indeed, in some delicate children at a later age this time is too long to fast.

1016. **For Breakfast and Tea**, any of the annexed dishes may be used with advantage; but there is after all nothing more digestible, and at the same time more agreeable to the palate of the child, than bread and butter, with milk and water, or with *very* weak black tea. It is a great mistake to suppose that butter is unwholesome for the child; the fact is, that dry bread, or "bread and scrape," is far more so, from being deficient in the heat-producing element supplied by the butter. When children are allowed plenty of air and exercise, and are not made dyspeptic by confinement, the use of butter in moderation is attended with the most beneficial effect. Preserves, or honey, answer the same purpose; and, for children who are not liable to diarrhœa, they are very well suited. Some weakly children require a more liberal diet, and will be the better even at this meal for a wine-glass of sound home-brewed malt liquor, instead of the above liquids, together with an egg or a piece of meat, either cold or plainly minced; and, though these are the exceptions, yet they are by no means rare. I have succeeded in this way in restoring health to the most delicate children, who have afterwards grown up the strongest of the family, and have, in spite of their early introduction to fermented liquors, been able to dispense with them wholly in after-life. I do not, I confess, like the indiscriminate use of these for children; but, at the same time, I am assured that in the above cases they are of the very highest value.

1017. **Breakfast Dishes**:—

(*a*) **Oatmeal Porridge** (*a genuine Scotch receipt*).—Put as much water as will make as much porridge as is wished into a saucepan, let it boil; then take a handful of meal in the left hand, letting it fall gently into the water, while stirring the meal and water quickly round with the right, with a wooden stirrer or spoon; do this till it is the thickness of thick gruel, then salt to the taste; let it boil for ten minutes, add a little more boiling water, and boil it other five minutes, which makes it quite smooth and very digestible (boiling it well is the great secret for making it digestible and nourishing for invalids). It is poured out in pudding dishes for each member of a Scotch family, and they dip each spoonful into a jugful of milk, and thus make a hearty and nourishing breakfast. The poorer classes of children often have it for their evening meal too; and in this way it forms the principal food for Scotch children, who seldom ever tire of it till they grow up.

(*b*) **Rice Porridge**.—On half a pound of rice pour three quarts of boiling water; let it swell till it becomes quite a jelly. Add one quarter (or half) a pound of oatmeal, mixing it first with cold water; stir it well together, add one ounce of onions chopped fine, half an ounce of bacon fat, butter, or lard; salt and pepper to taste; boil all together, stirring all the time.

(*c*) **Flour Milk** is made by mixing up a table-spoonful of wheat-flour in water to a thin paste, then stirring it into a pint of boiling milk till it thickens. It may be eaten with sugar or treacle.

(*d*) **Rice and Sago Milks** are made by washing the grains nicely, and simmering with milk over a slow fire till sufficiently done. The former sort requires lemon, spice, and sugar; the latter is good without anything to flavour it.

(*e*) **Bread and Milk**.—Cut or break stale bread into fragments, then boil in milk for a quarter of an hour.

(*f*) **Frumety**.—Boil a quarter of a pint of wheat for three or four hours; then add one quart of milk, with two spoonfuls of flour mixed with it, two eggs, three-parts of a small tea-cupful of raisins and currants, a little lemon-peel and cinnamon. Boil for a quarter of an hour, and serve.

1018. **For Dinner**, the diet should consist partly of plain meats, fish, poultry, or game, and partly of vegetables and puddings, which may be made of fresh fruit in the proper season, and occasionally of preserved fruits at other times. Variety is essential to the child, and though I am not sure that the plan is a good one of giving part of each of the above kinds of food of sodium, which is now so largely at one meal, however universal it may be, yet I am confident that, if not together, they ought to be allowed on alternate days. I believe that children will eat quite enough of one dish at one time to do them good, and if restrained to this would seldom over-eat themselves. But just as the older *gourmand* distends his stomach by partaking of every dish handed to him, so the child will eat a quantity of pudding after he has satiated himself with meat, or *vice versâ*, as is the case in some establishments. Under the existing plan it is necessary to place a bridle on the child, and to limit his allowance, and though this might still be necessary, yet it would not be so to the same extent. I would, therefore, strongly advise a good meal of animal food and vegetables on alternate days, with substantial puddings intervening. Thus, suppose a dinner of roast mutton and potatoes, with cauliflowers, on Monday; then on Tuesday, a gooseberry pudding might be given, with a liberal allowance of bread to eat with it, and made with a substantial, but light suet crust. It is astonishing what a quantity is now put into a child's stomach, when the bread, and the meat, and vegetables, followed by the solid pudding, are all taken into consideration, It is no wonder that they are often heavy and indisposed, and demand on the next morning a visit to the medicine-chest to get rid of the superfluous food, which has already kicked up a disturbance. I do not say that all children can thrive upon a diet composed only of meat on alternate days; but I am persuaded that the majority of healthy children would be the better for it. If, on the other hand, animal food is found to be necessary, it should either be limited in quantity to a half meal, or it should be taken without its attendant pudding. The plan of allowing children to fill themselves with pudding, and then have what meat they can eat, is still worse; because from experience it is found that, though in this way the cost is less, yet more bulk of food is swallowed, and the stomach suffers accordingly. The cost is less, because one pound of pudding and a quarter of a pound of meat cost less than three-quarters of a pound of meat and half a pound of pudding, which would be something like the proportions in which the two would be taken; though they are more altogether than most children would swallow, even if unchecked. Beef and mutton, and lamb, roasted and eaten hot or cold, or hashed, or minced with little or no spice, and with a slight flavouring only of onion and ketchup or vinegar, and mutton chops or beefsteaks, are the staple animal food, Veal may be indulged in as an occasional change, and especially when stewed with rice in a plain way, with a very little spice. Pork is not very wholesome, and is only adapted for very strong children who can digest almost anything. Salt meats are rather too hard for the stomachs of children and they have also lost the most valuable ingredient for supplying the wants of the child in the saline matters which have escaped in the process of salting. Good ham and bacon are, however, not to be rejected as unfit for the nursery, though only useful as adjuncts to vegetable meals, or to veal or chicken. Potatoes, cauliflowers, brocoli, and cabbage are all very well suited to the child's wants, as also are French beans, peas, and broad-beans, in moderate quantities. Spring spinach, turnip-tops, and nettles are valuable, because they can be obtained at a time when there is little else of a digestible character, in the shape of green vegetables, and when winter has stopped the supply for so long a time as to make them doubly useful. With regard to puddings, the following may be used with advantage:—

(*a*) OATMEAL PUDDING.—Pour a quart of boiling milk over a pint of the best *fine* oatmeal, let it soak all night; next day beat one egg, and mix a little salt; butter a little basin that will just hold it; cover it tight with a floured cloth, and boil it an hour and a half. Eat it with cold butter and salt. When cold, slice and toast it, and eat it as oat-cake buttered.

(*b*) PREPARED BARLEY PUDDING.—

Mix four table-spoonfuls of barley with sufficient cold milk to form a paste, pour on it one quart of scalding milk; then add a small slice of butter, and one or two eggs well beaten, flavour with nutmeg, lemon-peel, and sweeten with sugar. Be careful to stir the barley well while pouring on it the boiling milk, and not to put in the eggs till the mixture is cold. The eggs must also be well mixed in. Bake an hour and a half in a slow oven.

(*c*) GOOD BATTER PUDDING.—To one pint of new milk add two eggs, four spoonfuls of flour, and bake in cups, or boil.

(*d*) HASTY PUDDING.—Boil a pint of milk, then whilst boiling stir into it as much flour as will thicken it, generally about a table-spoonful. Serve hot with sugar, or, if preferred, the best treacle.

(*e*) HASTY PUDDING BAKED.—Stir half a pound of flour into a pint of cold milk, and boil it; then take two eggs, and add them to the hasty pudding when cold. Sweeten with sugar and bake in cups.

(*f*) PLAIN RICE PUDDING.—Wash and pick some Carolina rice; throw among it some pimento finely pounded, but not much; tie the rice in a cloth, and leave plenty of room for it to swell. Boil in it a quantity of water for an hour or two. When done, serve it with butter and sugar, or milk.

(*g*) COMMON BAKED RICE PUDDING.—Put half a tea-cupful of rice in a dish, with a pint of skim or new milk, a little sugar, and nutmeg or lemon-peel to be added, with, if preferred, a small slice of butter or dripping, or a few pieces of suet put on the top. Bake slowly, and stir it occasionally at first, to prevent the rice from burning to the bottom. If required to turn out, the dish must be buttered. An egg is a great improvement to this pudding; and, if it is liked in a milky condition, less rice must be used.

(*h*) A GROUND RICE PUDDING.—Add to one pint of milk one or two eggs well beaten, and one and a half table-spoonful of ground rice; boil these together, stirring them. Pour the mixture while hot over one ounce of butter; sugar to the taste, and then add the grated rind of a middle-sized lemon.

(*i*) TAPIOCA PUDDING.—Soak two table-spoonfuls of tapioca in a quart of cold milk for four hours; mix with it one egg well beaten, two ounces of sugar, and a little grated lemon-peel; let it boil, stirring it all the time, to prevent the egg from turning the milk. Bake it in a dish for half an hour.

(*j*) SAGO PUDDING. — Put three ounces of sago to soak in cold water for half an hour, then pour off the water, and stir the sago by degrees into a pint of milk boiling hot in a saucepan; let it boil ten minutes. Stir it till quite cold. Beat an egg well; mix it with a little cold milk, one ounce of sugar, and a little grated lemon-peel. Mix all well together, and bake in a slow oven an hour and a quarter.

(*k*) SEMOLINA PUDDING.—Add two ounces of semolina, previously soaked in a little cold milk for half an hour, to a pint of boiling milk, in the same way as for sago pudding, and add the egg and lemon-peel also, as in that pudding (which see at *j*).

(*l*) ARROWROOT PUDDING.—Mix an ounce and a half of West Indian arrowroot with a little cold water into a thin smooth paste; while doing this, boil a pint of milk gently with a little cinnamon and sugar; when boiling, pour it into a basin through a strainer upon the arrowroot, stirring it carefully; as soon as this becomes cool, beat an egg, and add it, stirring it well in. Then boil in a basin, or bake in a dish with a crust on the edge. From half an hour to three quarters is sufficient.

1019. SALT AND SPICES are not equally required by the child, the former being an absolute necessary, while the latter may or may not be desirable, according to the particular constitution. Salt, in all cases, should be liberally used, as upon it depends in great measure the power of obtaining certain mineral elements required for the supply of the blood. Bay-salt is better than the almost pure chloride used in this country, and obtained from the salt-springs of Cheshire and Worcestershire. The latter is admirably adapted for most domestic purposes; but for children's use pure and genuine bay-salt should, if possible, be obtained, containing all the mineral elements of sea-water, and being almost as efficacious, when regularly used, as sea-air. Unless the child is very weakly and dyspeptic, spices are not necessary; but in that case a very little black pepper, with a slight flavouring of pimento or cloves, may be used, as may also be cinnamon for sweet dishes.

1020. THE BEVERAGE suited to the dinner is spring water, or toast and water made by simply pouring cold water upon a toasted piece of bread. In weakly children, small home-brewed beer may be allowed, but not for strong healthy children of this age; about a quarter of a pint is all that should be allowed on the average, for beyond this drinking only increases the appetite for solid food, and as the great difficulty in hearty children is to satisfy this without clogging the stomach, so the limitation of the fluid prevents over-distention in two ways—1st, by the actual diminution in volume equal to the quantity by which it is lessened; and 2nd, by preventing that gluttonous yielding to the appetite which drinking enables them to indulge. When malt-liquor is given the quantity should rarely exceed three or four ounces.

SECT. 5.—MANAGEMENT AT MEALS.

1021. There is no time when the temper of a badly managed child is so completely exposed as at this period of the day; and also it may be said, that the opposite condition will show itself equally truthfully. The mother, or a very superior nurse, should always be present at these times, and by her authority compel a strict attention to the rules laid down, inculcate an orderly deportment, and a proper waiting for the turn of each to receive the allotted share. Young children, of course, require their meat cut up for them; but after this is done, it is better to allow them to feed themselves, as they then show the approach of satiety much more clearly than when each mouthful is offered by the nurse. Whenever children begin to play with their food, it is a sign that they have had enough, and the remainder, if any, should be removed. Greediness in eating is one extreme which should be checked as alike contrary to the dictates of good manners and good health; but a listless and careless trifling and picking at the plate is the opposite fault, which is much more readily checked by taking away all opportunity of displaying it the moment it is rendered apparent. It is now the fashion to introduce silver into the nursery, steel-forks being abolished there as well as in the adults' dining-room; but this, I believe, is a great mistake, and only adds to the already great difficulty in supplying iron enough for the wants of the system. What with enamelled and tinned saucepans, wooden spoons, and silver or plated forks, there is little iron now used in the kitchen, except the knife, which fortunately cannot be superseded by any known metal. The consequence is, that steel is obliged to be given medicinally; and this is one reason for the prevalence of that medicine as a fashionable remedy in the present day. I would, therefore, counsel the use of steel-forks in the nursery as well as steel-knives; for in this department silver-*knives* even are often introduced, partly to avoid the danger of the child cutting himself, which may be easily prevented by taking care that his steel-knife has a blunt edge. To carry this theory so far as to use iron-spoons, is perhaps riding a hobby to death; but I am not sure that it would not be a better extreme than the present crusade against this useful metal. We have iron in our blood, but neither silver nor gold; and hence we want the one metal, while the others are perfectly useless to us. Nothing, however, is so bad as the alloys of copper, sold as nickel-silver, albata-plate, &c., which are just as prejudicial as pure copper, or brass, and when used with vinegar, give off large quantity of acetate of copper, a most injurious and even poisonous salt.

SECT. 6.—SLEEP.

1022. THE SLEEP OF THE CHILD at this age is naturally sound, and of long duration. From twelve to fourteen hours will not be too much to restore the nervous energy lost during the constant and restless activity of the other portion of the twenty-four. Until four, or even six, years of age, an interval in the middle of the day, of about two hours' duration, should be assigned for sleep, in which the brain is rested, and the soft and yielding substance between the bones of the back, as well as the general ligaments of the joints, are allowed to regain their tone. There is a prejudice against this practice among some old-fashioned people, who have been taught to depend upon high-backed chairs and back-boards for support; but those who will wish to follow nature have only to watch the foal, the lamb, or the puppy, and they will see a rest at full length taken invariably once, if not twice, in the course of the day. All young animals which rest at night, including the domestic animals among them, begin the day by feeding; they then take a good gallop until they are tired, after which they lie down at full length till the heat of the day is past, in the middle of which they just rouse themselves enough to feed again, and in the evening they take a second amount of exercise or play, after which comes the evening meal, and then a long night's sleep. We never see any young animal *standing* on its legs long together, or sitting up in any position; for the moment it has ceased to move, it lies down and rests every voluntary muscle of its body, and every joint too. It may be, perhaps, going too far to copy this example exactly and literally, because the child at the age now under consideration is not a mere animal, but it has a mind and soul which must both be considered in the scheme of its rearing, and therefore the body must be sacrificed to some extent. But still this is not the ground of objection to the *siesta*, for no one can maintain that two hours will be missed in the middle of the day at this early age, when, indeed, the difficulty is, not how to find time enough for what is to be done, but rather how to occupy beneficially the long hours from breakfast till bed-time. In every point of view, I am satisfied that it is desirable to keep up this habit until the child is five years old, at least; and I would certainly, from that age till six, make every child lie down, even if awake, for an hour in the middle of each day. I have seen so many crooked spines from the opposite plan, and I have succeeded in restoring so many which had begun to bend, merely by following out this plan with the aid of friction alone, that I cannot doubt its efficiency.

1023. THE BED AND BED-ROOM require some little management at this age, because it is one when children demand supervision at night, and yet they should not be crowded together. At page 8, I have gone into the proper and lowest cubical area which can be allowed for each child; but, besides this, it is now very important that each should have a separate bed, and it is even desirable to separate the boys from the girls in their sleeping-rooms. There are many reasons for this; but, with regard to the single beds, the fact of its importance in reference to health ought to be a sufficient one. Children all perspire more freely than adults, and, as a consequence, their skins are kept more cool; they are, therefore, made too hot by contact with grown people, and perspire more when they sleep with them than they would do by themselves. Contact with the skin of a child of the same age has not so great an effect; but still the two serve to aggravate each others perspiration, and so they convert what is a natural healthy process into a source of weakness, by exhaustion of the fluids. A fire in the bed-room is not by any means desirable for healthy children, unless the room is very large, and the weather exceedingly severe, when the aid of its heat is beneficial, by avoiding the excessive chill in getting out of bed, or in case of the clothes being thrown off during sleep.

1024. THE BEDS AND BEDDING should be airy, free from all hangings, and cool. Wool and hair are the best materials for mattresses, and feathers should be expunged altogether from the nursery. Even the pillows should be of hair, by which the head is kept much more cool. A night-cap is almost necessary to the long hair of the girl; but it need only be an open net, which will keep it tidy, without making the head hot. Boys are much better without caps at all, as their short hair will be none the worse for a slight entanglement, which the comb will soon cause to disappear in the morning. A common source of colds in children is the habit of throwing off the bed-clothes during sleep, which, of course, exposes the limbs, and gives occasion to severe chills all the winter. The child always perspires freely during sleep, and therefore suffers still more than an adult, if this state is checked by a partial or total loss of the covering. To prevent this habit, there is often very great difficulty, as the limbs can scarcely be kept in the bed by any contrivance of which I am aware. The only successful plan is to make a flannel bag, rather longer than the child is high, and of sufficient substance to protect it from cold. This may or may not be lined with calico, according to the sensitiveness of the child's skin; and if the weather is very cold, it may be even covered with another bag of quilted cotton or eider-down. The bag should be drawn in the usual way at the mouth, and should be tied round the neck of the child, after putting it to bed, so as to include the whole body with the arms in a loose envelope, which cannot be kicked off. It is not necessary to tie this tightly round the neck, nor is it always desirable to fix it higher up than the waist, which latter is a much less troublesome mode of putting it on; but in children who are delicate about the chest, its exposure, together with that of the arms, should be carefully guarded against, and the bag being made small at the mouth, and gradually increasing in size towards the feet, there is little or no puckering round the neck, and therefore can be no annoyance or uneasiness from folds under the weight of the shoulders or head.

SECT. 7.—EXERCISE.

1025. EXERCISE is no less important now than at the previous age, when it was described as an essential to health and growth (see page 286). As the child grows older, he is able to take more without assistance, and discards the perambulator with disdain. It is a cruelty to confine the young child for long together to any one position or task; and though infant schools may be better than the kennel of a low neighbourhood in a large city, yet at best they are too often but barbarous substitutes for a more lenient superintendence. When, however, the children in them are kept constantly amused and occupied, this objection does not hold good, for no nurse can do more; but in most of them the child is confined to one position for a certain time, and punished for any infraction of the unnatural law. Children at all ages ought to be taught obedience; but for that very reason, if for no other, a task beyond their strength ought never to be set them, or they will not only injure their bodies by its excessive severity, but will also be morally the worse in consequence of their forced rebellion against the constituted authority. But exercise should not be converted into a disagreeable task by confining the child to a formal walk, without object or amusement. In towns it is certainly very difficult to find anything which will interest the child in his walks; but there are few of such a size that the green fields or a park cannot be reached, and then the intelligent governess or parent will always find either some animated being to occupy the attention of the child, or may adopt some game or other out-of-door amusement. It is in this way only that the frame is invigorated to the fullest extent of which it is capable, while at the same time the chest is expanded, and the blood circulated in the extremities and on the surface.

CHAP. V.

TREATMENT OF THE ORDINARY DISEASES OF CHILDREN.

SECT. 1.—IRREGULAR DENTITION, AND THE MANAGEMENT OF THE PERMANENT TEETH.

1026. THE MILK TEETH continue to serve the purpose of mastication during the first six or seven years of the child's life; but as during that time the jaws have greatly increased in size, these teeth, which originally fitted the jaw of the infant, and when once formed have no further power of growth, are no longer of sufficient size or strength; it is therefore provided by nature that they shall be replaced by a second set, called the permanent teeth, which last till they are worn out by constant use or by disease. As these permanent teeth increase in size, and approach the surface of the gum, the fangs of the milk teeth are absorbed to make room for them; and it is for this reason that the former come out so readily, and are often quite loose in the mouth for a long time. In this state they are much better removed, as they are apt to displace the new teeth from their proper position; but it does harm rather than good to take them out as long as they are firmly imbedded in their sockets, and while their fangs are whole. Sometimes, however, the jaw is small as compared with the teeth, and in that case room must be made for those which are most conspicuous, by drawing the adjacent teeth which are of least consequence.

1027. The following is the most usual order and time of appearance of the different permanent teeth. Though here, as in the milk teeth, great irregularity is often observed, and the table can only be considered as an approximation to the average time.

PERMANENT TEETH.

	Years of Age.
First molars are cut at	6½ to 7
Central incisors	7 to 8
Lateral incisors	8 to 9
First bicuspid	9 to 10
Second bicuspid	10 to 11
Canines	12 to 12½
Second molars	12½ to 14
Third molars (wisdom teeth)	16 to 30

1028. MANAGEMENT OF THE TEETH.—The mother who watches her children's teeth as they successively make their appearance, has a very different task to perform from that which is demanded by her own set; and unless she understands the nature of the charge, or entrusts it to another more competent than herself, she will very probably overlook much which ought to engage her attention. In the cutting of the milk teeth, there is very little cause for anxiety or interference, so far as the teeth themselves are concerned; but when the second set are making their appearance, the mother, who regards the future welfare of her children in point of comfort and personal beauty, will see that they are allowed room and space for their proper arrangement in the mouth. Children at a very early age should be encouraged to wash out their mouths and brush their teeth with a soft brush (but no powder); and if the gums are at all spongy or inclined to bleed, the addition of a little tincture of myrrh will render them more hard and healthy; but the tartar formed upon milk teeth is not of any further consequence than as showing a slight tendency to ill-health, inasmuch as it is all removed with the tooth to which it is attached. But if the first teeth are very small, and at the same time closely set, it often happens that the second set are too large for their places, and as they emerge they crowd one another so much that they cannot find room to stand in a regular row, and part, or all, fall out of the rank. When this is the case one or more teeth must be extracted; but as the incisors and canine teeth are very conspicuous, and their absence is very readily detected, it is considered better to remove the first bicuspid, which permits the adjacent teeth to extend themselves and assume a regular position. If this is done early enough, in most cases it is sufficient; but if not, a plate must be fixed in the opposite jaw in such a way as to meet the tooth in a slanting direction, and so force it into its place, or it must be brought in by strong silk, tying it to the adjacent teeth. These plans must, however, be entrusted to a skilful dentist; they are only mentioned here in order that the mother may be made aware of the fact, that by his aid she may hope to rectify the errors occasioned by her omitting to have earlier assistance.

1029. The Milk Teeth often decay and give pain, and if so, they may be removed; but, if possible, they should be preserved until the fangs are absorbed. In many cases, without any decay they will require slight interference, from their adhering to their sockets longer than is desirable or prudent, in reference to the new teeth; in almost all cases, however, these fangs are absorbed before the new tooth shows itself, and from this circumstance a very slight force is sufficient to remove them.

1030. When the permanent teeth in the child decay or become in any way diseased, they are to be treated exactly in the same way as those of the adult, the only caution necessary being to attend to them in the early stage when the disease may generally be arrested. The slightest speck of caries should be cut out and filled by the dentist, and in that way the tooth, which would probably be entirely lost in a few months, may be preserved for the remainder of life.

Sect. 2.—The Febrile Diseases of Childhood.

1031. The Fevers to which the children of this country are chiefly liable, are 1st,—the *common ephemeral fever*; 2nd, *infantile remittent*; and 3rd, the various *eruptive fevers*, viz., *small-pox*, *cow-pox*, *chicken-pox* or *swine-pox*, *scarlatina*, and *measles*. But besides these they occasionally are attacked by *typhus*, and still more rarely by *intermittent* fever.

1032. In the Ephemeral Fever of the child, the symptoms do not differ from those described at page 24, but there is a strong tendency in all cases to assume the remittent type (par. 83). The treatment must be regulated by the condition of the digestive organs, which are often out of order, and if so, they must at once be attended to. There can be no doubt that in a strong hearty child nothing cuts short an attack of this kind like a dose of calomel, followed by a mild aperient; and if the stomach is much out of order, and the liver acting sluggishly, it is perhaps the best practice to pursue, *taking care not to adopt it on all occasions*, but to reserve it for violent attacks which seem beyond the influence of rest and milder remedies. On the other hand, if the child is not much upset and the tongue is tolerably clean, with healthy motions, a dose of rhubarb and ipecacuanha (page 269) will suffice. In either case the following fever medicine may be given wth advantage:—

Take of Nitrate of potass, gr. xx.
Liquor of acetate of ammonia, ℥ss.
Spirit of nitric ether, ʒij.
Tincture of henbane, ʒiss.
Simple syrup, ʒij.
Water, ℥ij.

Mix and give a dessert-spoonful or table-spoonful every four hours.

1033. The Treatment of Typhus Fever (par. 65) and of intermittent fever (par. 76), is the same as that of the corresponding kinds in the adult, and need not, therefore, be further alluded to here.

1034. Infantile Remittent Fever (par. 83) is the form of severe febrile disease most commonly met with in the child. The treatment will greatly depend upon the particular constitution and the state of the stomach, as well as upon the cause of the attack, if it can be ascertained. If it can be traced to an excess in rich food, the first thing to be done is to get rid of this by means of an emetic, followed by a purgative, or by the latter alone; but in that case it must include some preparation of mercury. The great advantage of the emetic in this disease is, that it acts rapidly and mechanically on the liver, unloading it of blood and bile, and rendering it much more capable of continuing to secrete the latter. For this reason, therefore, in this form of fever attacking a healthy child after an excess on pastry, or other improper food, I think an emetic (see page 270) of great service, and it should be followed up by a dose of tartrate of potass in about five or six hours afterwards. There is nearly the same objection to emetics as to mercurials, namely, that they weaken the stomach; but, as remittent fever does not often attack the same child, the advantage gained by the use of one emetic, or one dose of mercurial, is not to be counterbalanced by their lowering effect upon the stomach, which no doubt is an objection to their constant or frequent employment. When these have acted, the following effervescing mixture may be given, taking care to let nearly all the gas escape before giving it to children younger than five or six years of age, who are frightened by it.

Take of Bicarbonate of soda, ʒij.
Syrup of orange peel, ʒiij.
Spirit of nitric ether, ʒiss.
Water, ℥vss.

Mix, and give a dessert-spoonful every four hours, with a tea-spoonful of lemon-juice. To a child of more than six, a table-spoonful is the dose, with a dessert-spoonful of lemon-juice. On the other hand, when the cause is to be looked for in continued constipation, the mercurial purgative is more especially required, and this will often suffice; while if teething is the source of the irritation, a free lancing of the gums and the use of the mixture without the aperient will be appropriate. Unless there is great irritation of the mucous membrane, as evidenced by a large quantity of mucus, it is never wise to stop diarrhœa very suddenly. Sometimes, however, there is so great a state of irritation as to compel attention to it, and then a few doses of the chalk-mixture (page 239), with four or five grains of the aromatic confection, will generally suffice. Beyond these remedies it is seldom necessary to go, and certainly it is not prudent for the mother to venture upon anything more active. Very often, however, the bowels become seriously inflamed (see *gastritis* and *enteritis*) and will require a few leeches, with the addition, in some few cases, of very small doses of mercury and opium, which must be given in the form either of calomel or mercury-with-chalk, and in often repeated, but very small, doses, while the opium must be very cautiously administered, as it is a most dangerous medicine in inexperienced hands. Indeed, in every case, this disease is better entrusted to the management of the regular practitioner, as it varies greatly in its symptoms, and especially also in the treatment adapted to them. There are few disorders of the body in which so much good may be done by appropriate, yet gentle, remedies administered at the right time, and very few where bad treatment has such an injurious effect. The prudent mother will therefore act wisely if she entrusts her child to some one in whom she can have confidence; and if she has no opportunity of making such selection, she had better trust to nature almost entirely than go beyond the first set of remedies which I have advised, and which will seldom act otherwise than well. This fever, like all others, will have a certain course, and cannot be compelled to alter it, though it may often be prevented from going beyond the limit which is fixed as that of organic mischief. The principle in the treatment is to watch the symptoms as they arise, and to guard against the effects of inflammation when it attacks any important organ, such as the brain, the lungs, or the stomach and bowels, leaving the fever itself to work its own natural cure, with the aid of such simple cooling remedies as are assigned above, and also appropriate diet, which may be described as consisting of the mildest kinds of farinaceous food in the early stage, such as gruel, or panada, if the bowels are not loose, and arrowroot if they are. When the tongue is cleaning, a little chicken-broth may be tried, and, if this agrees, give beef-tea as an occasional change. For drink, there is nothing better than imperial (par. 904), or, if the bowels are relaxed, rice-water (par. 896); toast-water may also be allowed, or barley-water; great quiet, and plenty of ventilation are highly important accessories. In the *convalescence* from this fever, give quinine; port wine, and nourishing animal broths are absolutely essential, avoiding solid food until the stomach has nearly recovered its tone. Change of air is also an important aid in the recovery.

1035. SMALL-POX (page 31), when attacking the child, requires little or no modification from the treatment practised on the adult, which see. It may, in almost all cases, be prevented by vaccination.

1036. THE COW-POX is described at length at pages 33, 34, 35, and 36, and the mode of vaccination at page 267. The treatment required after this is merely a slight amount of lowering during the febrile stage, by means of a reduction in the diet, and the administration of a simple aperient, such as rhubarb and magnesia, which acts as well as anything, or perhaps better.

1037. CHICKEN-POX (page 36) is so seldom attended with any considerable amount of febrile disturbance or other complication, that it merely requires a few days' rest, and the reduction of the diet to a slight extent, removing all kinds of animal food, and giving slops and light puddings. If the bowels are confined, a *very mild* and simple aperient should be given, but it is far better avoided, if possible. Sometimes there is enough fever to require a few doses of a febrifuge, such as that ordered at par. 1032, but this is seldom the case. If the vesicles are not picked, they will very seldom leave a mark, so that it is always desirable to watch the child when there are any on the face, and to see that this is avoided, for if otherwise, very ugly scars are often produced, which no art can remove.

1038. MEASLES (page 38) is a disease which generally requires little or no medicine, unless the eruption is prevented from coming out, or the lungs, bowels, or head, are attacked by inflammation. In all cases the child should be kept in bed, and as the eyes are inflamed, it is well to prevent any glaring light, by drawing the window-blinds. At the same time the room should be thoroughly ventilated, taking care to keep it at a temperature which is comfortable to the attendants at a distance from the fire. If the eruption is slow in coming out, the following diaphoretic mixture may be given, and in any case a little of it can do no harm.

Take of Ipecacuanha wine, ʒij.
Spirit of nitric ether, ʒiiss.
Liq. of acetate of ammonia, ℥j.
Syrup, ʒij.
Camphor mixture, ℥iv.

Mix, and give a dessert or table spoonful every four hours. In feeble children it may be necessary to add to the above mixture two or three drachms of sal-volatile, and in addition, to put them into the warm bath for ten minutes. Unless the bowels are very much confined, it is seldom advisable to use aperients during the time when the eruption is making its appearance or for forty-eight hours afterwards, but if absolutely required castor-oil is the best for the purpose. If the *head* is much affected, and especially if there are fits, leeches to the temples and a blister to the top of the head or the back of the neck are the appropriate remedies, giving the diaphoretic mixture at the same time, and preceding it by the use of the warm bath. When, as is very often the case, the *lungs*, or their lining membrane, become inflamed, with marks of *pneumonia* (par. 228), or of *bronchitis* (par. 142), the treatment must be modified accordingly. If the lungs themselves are actively inflamed, blood must be taken either from the arm, or by leeches from the chest, according to the age of the child, and on the next day, if the symptoms are not relieved, a blister must be applied, or a stimulating embrocation may be tried beneath the spongio-piline (page 264), which will act with greater rapidity than the blister, and the antimonial mixture, which will be found under *Pneumonia*, must be administered. In cases of severe bronchitis, of which there is always more or less in measles, the diaphoretic mixture (par. 1038) may be given at short intervals, with the addition of a little more ipecacuanha. In the *diarrhœa*, which is apt to come on in the latter part of the disease, it is desirable to give a gentle dose of rhubarb and magnesia, and if the motions are offensive or light-coloured to unite with this a grain or two of calomel. If this does not stop the looseness, chalk-mixture (page 239) may be tried, with the addition of a little aromatic confection, and two or three drops of laudanum to each dose. At the same time a stimulating embrocation may be rubbed into the bowels, or be applied beneath the spongio-piline (page 264). If the measles assume a typhoid character, the attack must be treated in the same way as genuine typhus (which see). Ordinary cases of measles may very well be managed by a mother or nurse accustomed to the task, but if any of the above complications occur, she will do wisely to avoid incurring any further responsibility. The *sequels* of measles are to be treated according to the directions laid down for each kind, when occurring without its previous existence.

1039. SCARLET FEVER (page 38), when *simple*, is like measles in its ordinary form, a disease which any mother may undertake the management of; but when it assumes the appearances described under par. 114 and 115, it is so highly dangerous, and its course is so rapid, that no time should be lost in seeking more competent assistance. In this *simple kind*, the treatment required is chiefly confinement to bed in a *cool* room, with cooling drinks, no solid food of any kind, and all slops to be taken without animal jelly. It must be remembered that the whole mucous membrane lining the stomach and bowels is in a state of active congestion, and therefore requires the greatest care in the selection of unirritating food. Purgatives should be especially avoided, unless the bowels are obstinately confined, and if they are so, castor-oil is the only kind fit for the occasion. If the skin is hot it may be sponged with cold water, or vinegar and water, but great care is required in the use of this application, if it is not quite clear that the heat of the surface is as great as usual. When the eruption is slow in coming out, or when it does not remain of a bright red colour, cold sponging is prejudical, and will tend to check the proper development of the disease, and to cause internal congestions of a serious character. It is better, therefore, to avoid its use, unless the heat of the surface is so high as to give the sensation of burning to the hand, and the eruption is of a vivid scarlet colour. The following cooling mixture may be used with advantage in most cases:—

Take of Nitrate of potass, ʒj.
Spirit of nitric ether, ʒiij.
Sugar, ʒiij.
Water, ℥vij.

Mix, and give a dessert or table spoonful every four hours; or the nitrate of potass may be dissolved in a quart of whey, and given occasionally as a cooling drink. When the throat becomes very sore, a blister applied externally to the sides of the throat affords great relief; or some hartshorn and oil (par. 836 A) used with flannel, or under spongio-piline, may be applied. Gargles are not often managed well by children, but after the eighth or tenth year sometimes they can be adopted. Sage tea, with one quarter of its measure of vinegar, forms a good and safe gargle, which may be freely used; or the sage tea may be employed acidulated with diluted hydrochloric acid instead of the vinegar, the proper strength being two or three drachms of the diluted acid to half a pint of the sage tea. The *lungs* are not so often attacked as in measles, but occasionally they form the seat of complication, and the case is then of a most dangerous character, urgently requiring the superintendence of a man of experience and skill. Bleeding or leeching may be absolutely demanded to avoid a fatal termination; but no more blood should be taken than is absolutely necessary. When the attack of scarlet fever assumes a typhoid appearance, the case must be treated exactly like typhus itself (which see), but it is useless for the mother to attempt the management of such a dangerous disease. In the stage of *convalescence*, the diet should be of a thoroughly nourishing kind, with a free allowance of animal food, and in subjects much lowered in their strength, with port wine or malt liquor. Quinine will also frequently be found necessary, and in some cases the combination of quinine and iron is required, as in pale and anœmic children, whose bloodless skins are evidences that iron is deficient. The most common *sequel* of scarlatina is a dropsical effusion in the limbs, which must be prevented, if possible, by a careful and constant attention to the state of the motions and urine. It will generally be found that, if these are watched, the liver does not act properly for some time before the dropsy shows itself, and at the same time the urine is scanty and high coloured. The remedy for these states is to be found in the use of cholagogues and mild diuretics in small doses, but commencing as soon as there is evidence of the failure in either secretion. If the child is young, mercury-with-chalk must be given in grain-doses twice a day, combined with an equal quantity of powdered rhubarb; and this medicine may be administered to older children by increasing the dose in proportion to the age; but should it fail to act on the liver, calomel must be given instead, the dose being from half a grain to a grain twice a day, taking care not to produce salivation, which, however, is rare in young children. As soon as bile shows itself in the motions, the mercurial may be withdrawn, and ipecacuanha substituted for it, keeping up the action also with the same quantity of rhubarb as before. In order to act on the kidneys, when they do not secrete sufficient urine, the following mixture will generally suffice, if commenced as soon as the secretion begins to be scanty:—

Take of Nitrate of potass, ʒj.
Tincture of squills,
Spirit of nitric ether, ā ʒij.
Water, ℥vss.

Mix, and give a dessert or table spoonful twice or thrice daily. It occasionally happens that this dropsical effusion is the result of weakness alone, and in that case quinine or steel, or a combination of the two in the form of the citrate, should be administered; but there is the greatest difficulty in selecting the appropriate remedy in this disease, and no one should voluntarily make the attempt. *Enlarged glands* are to be treated by the local application of hot salt and water, or by rubbing in the compound camphor liniment (par. 836 c) night and morning. At the same time strengthening diet and medicine should be given, and change of air should be had recourse to, a visit to the sea-side often acting like a charm. Strumous ophthalmia must be treated according to the directions given under that head.

SECT. 3.—TREATMENT OF THE INFLAMMATORY AND CONGESTIVE DISEASES OF CHILDREN.

1040. CHILDREN OF ALL AGES are peculiarly liable to these affections, arising probably from the constant growth of their bodies which is going on, and which demands a more than usual supply of blood for their nutrition. Many of them are identical in character and treatment with those to which the adult is also prone, and they will therefore not be included here; but there are some which are almost peculiar to the age of childhood, such as *croup*, *hooping-cough*, certain *skin diseases*, *hydrocephalus*, &c., and these will therefore be fully considered in the present section.

1041. IN THE TREATMENT OF INFLAMMATION in the child, general bleeding will seldom be required; but leeches are invaluable at this age, and may be adopted with safety, except in those weakly children who cannot bear the loss of a drop of blood without danger of serious consequences. Cold water, applied by means of the compress, (page 203) will often be of service, but, as a rule, children do not bear cold applications so well as adults, their systems not appearing capable of producing sufficient reaction on the surface. In addition to local applications, general antiphlogistic or eliminant remedies are useful, and these act either by directly lowering the inflammation through their peculiar effect on the heart and arteries, or by eliminating some of the materials of which the blood is composed, as is the case with the expectorants, cathartics, diaphoretics, and diuretics, all of which not only act locally on the several organs, but also generally by reducing the whole mass of blood.

Sub-Sect. A.—Treatment of Inflammations and Congestions of Mucous Membranes.

1042. Catarrh and Influenza do not often attack the young child, and when near the adult period, the treatment is the same as at that age.

1043. Acute Bronchitis (par. 143) requires very prompt and active treatment in the child. The most powerful remedy is nausea, produced by ipecacuanha or tartar emetic, which should be given every hour, until the desired effect is produced, and then continued at intervals of three or four hours. The dose of ipecacuanha wine is the same as that of antimony, and should be from eight drops to fifteen, or even twenty, mixed with a table-spoonful of water or camphor mixture, or barley-water, which is an excellent vehicle for the purpose. If the inflammation runs high, a leech or two should be applied to the chest, and they may be followed by a blister, or this may be used without them. In case the bowels are loaded, an aperient will be desirable, and may even precede the nauseant; but generally it is better to wait until this last has had time to lower the heart's action, and to stop the active stage of the inflammation. At this time the diet must be of the most sparing kind, and, indeed, no more should be given than will barely satisfy any cravings of the child. Barley-water is an excellent beverage, and may form almost the entire food for some days. As soon as the active stage is reduced, the disease may be treated by specific remedies, called expectorants, but it then becomes chronic bronchitis, which may next be considered.

1044. Chronic Bronchitis (par. 144) seldom occurs in the child, except as the sequel to the acute form. It is to be relieved in either case by some kind of expectorant medicine, such as one or other of the following mixtures or powders:—

Take of Ipecacuanha wine, ʒij.
Mixture of gum acacia, ℥ss.
Syrup of poppies, ʒiss.
Water, ℥iss.

Mix, and give a dessert to a table spoonful every four hours.

Or, take of—
Tincture of squills, ʒiss.
Bicarbonate of soda, gr. xv.
Compound tincture of benzoin, ʒj.
Syrup of tolu, ʒiij.
Compound tincture of camphor, ʒij.
Water, ℥ij.

Mix, and give a dessert to a table spoonful every four hours. (*This is useful where the cough is very sonorous and "barking."*)

Or, take of—
Diluted hydrocyanic acid, minims xviij.
Syrup of tolu, ʒij.
Distilled water, ℥vj.

Mix, and give a dessert or table spoonful every four hours. (*To be used in those cases where the pulse is very quick, but with great care, as it acts powerfully on the heart.*)

Or, take of—
Powdered ipecacuanha, gr. iij.
Calomel, gr. iss.
Powdered opium, gr. j.
Sugar, gr. xviij.

Mix well, and divide into six papers, one of which is to be given three times a day. (*Useful when the liver acts sluggishly.*)

Or, take of—
Powdered ipecacuanha, gr. iij.
Powdered rhubarb, gr. vj.
Bicarbonate of soda, gr. xviij.

Mix, and divide into six powders, one of which is to be given three times a day. (*In stomach-cough especially.*)

1045. IN THE TREATMENT OF HOOPING-COUGH (the symptoms and supposed nature of which are described at page 49), the remedies are almost all of an empirical kind, excepting when inflammation is present, and then the treatment must be such as to reduce that formidable disease. It is well, therefore, to consider the subject as divided into the treatment of simple *congestive hooping-cough*, and that of the *inflammatory* variety, in the same way as was done in describing its symptoms.

(*a*) *Simple Congestive Hooping-cough* occurring in a healthy child will often work its own cure, especially if the congestion is relieved by external applications, and friction of the back and chest. For this purpose "Roche's embrocation" has long enjoyed an extensive reputation in the cure of this complaint, and as far as my experience goes, is of great utility. The liniment of turpentine also is exceedingly useful, and appears to me to act like the above embrocation, in two ways,—1st, externally as a counter-irritant; and 2nd, internally as a local application to the mucous membrane of the air-tubes in the form of vapour, both being very volatile and readily inspired with the common air. They should be rubbed in before the fire night and morning. Attention should be paid to the state of the secretions, for which purpose nothing answers better than small doses of rhubarb, ipecacuanha, and soda, (see last par.) If the cough is very troublesome, and the appetite at the same time is bad, in consequence of the nausea lasting through the day, the following mixture may be given with advantage :—

Take of Diluted hydrocyanic acid, minims xij.
Infusion of orange-peel, ℥vj.

Mix, and give two dessert or table-spoonfuls twice or three times a day.

(*b*) In *inflammatory hooping-cough* (see par. 149), tartar emetic or ipecacuanha wine must be given in full doses, and at short intervals, so as to keep up a constant state of nausea. For this purpose, it is necessary to give from twenty to thirty drops of either wine (page 245) every half hour until vomiting takes place, and then to repeat the dose every three or four hours. The embrocations mentioned in the last paragraph (*a*) may be applied very regularly, or a blister may be had recourse to, if the attack of inflammation seems of an urgent character, or sometimes even a leech or two will be necessary.

(*c*) When the first and most urgent symptoms of hooping-cough have abated and convalescence is being established slowly, change of air will be of far more service than medicine, and especially if made to the sea-side. Indeed, by many people, it is supposed to be the most certain of all remedies for hooping-cough, and the only one upon which reliance can be placed.

(*d*) It is not often necessary to apply any local remedy for the pain in the head, which so frequently accompanies, or rather follows, the violent straining which goes on in this disease. If, however, the pain is great with evidence of a congestive condition, a mercurial aperient (par. 269), and a leech or two to the temples will generally set all to rights—that is to say, if hydrocephalus is not fully established.

(*e*) The diet should always be confined to the farinaceous kinds of food, except in the state of convalescence, when animal food and broths will usually be beneficial. No fermented liquor of any kind is desirable, or at all events not until the period of convalescence.

1046. CROUP.—When the attack is announced by the symptoms detailed at page 51, no time must be lost in giving the proper remedies described below, which will then, almost with certainty, afford relief. If, however, a delay, even of an hour or two, is allowed, the false membrane is thrown out in a solid form, and suffocation is almost inevitably produced. As soon, therefore, as the peculiar sound is recognised, the parent or nurse should lose no time in summoning medical assistance; *and, in the meantime*, she may give from 20 to 30 drops of ipecacuanha wine every ten or fifteen minutes until vomiting takes place, after which the dose should be repeated every half-hour, as long as the noise continues to be heard in the slightest degree, or till the case is put under the superintendence of the physician. If the noise when first heard is very hoarse and metallic, and if the respiration is hurried and difficult, with a blueness of the lips, it is better to give two or three grains of calomel by itself before beginning the emetic, as it is not liable to be brought up by vomiting, and it will act afterwards as an aperient. In severe cases, from three to eight, or even ten, leeches, must be applied to the throat close to the prominence, known as "Adam's apple;" the two largest of these numbers will of course only be applicable to children more than ten years of age, and then only when full of blood. There is also an objection to applying them to the throat at all, inasmuch as it is a part where, from the absence of bone, no pressure can be made to restrain the bleeding; but though this is a feasible ground of opposition to the selection of the spot in ordinary cases, yet there can be no doubt, that in croup the advantage attending upon their application to the immediate neighbourhood of the disease is so great, as more than to counterbalance the occasional difficulty in stopping the hœmorrhage. Besides, a dangerous amount of bleeding can never take place from leech bites within the time likely to be occupied in obtaining surgical aid; while the loss of the hour or two, from a fear of this result, can never be replaced. If this early adoption of efficient remedies is practised, there will very seldom be any second (or comparatively chronic) stage of croup; but if neglected, it often occurs, and it is then necessary to give repeated small doses of calomel, which may be united with antimony, or with ipecacuanha, as follows:—

Take of Tartar emetic, gr. j.
Calomel, gr. ij.
Powder of Chalk and opium, gr. xl.

Mix, and divide into eight powders, one to be given every four hours;

Or, take of—
Powdered ipecacuanha, gr. iv.
Calomel, gr. ij.
Powder of chalk and opium, gr. xl.

Mix, and divide into eight powders, to be given as above. If the danger is extreme, and medical aid is not at hand, mustard-plasters may be applied to the calves of the legs, in the hope of affording relief by counter-irritation.

1047. IN THE TREATMENT OF SPASMODIC CROUP (par. 156), the warm bath is the best domestic remedy during the fit, allowing plenty of fresh air for the child to breathe. The removal of the cause, however, is the only sure mode of preventing a return; and, as this is so variable, so must also be the remedies likely to afford relief.

1048. GASTRITIS (par. 157) is very apt to occur in young children, in whom, however, it is usually accompanied by a general inflammation of the mucous membrane of the alimentary canal, to which the French term *gastro-enterite* is applied. The symptoms do not vary greatly from those detailed at page 52, except in degree, since in the child they are not so severe as in the adult. In the *treatment*, unless the tenderness of the abdomen is very great, it will seldom be necessary to apply leeches, but sometimes this is the case; and then it is prudent to take blood locally by these means, the numbers used being in accordance with the age and strength of the child. A warm bath in the early stage will almost always afford relief, but afterwards it is too lowering to be used with safety. If the attack is a severe one, a small blister applied to the pit of the stomach will be proper, or in milder forms, a stimulating application, such as the compound camphor liniment, will be sufficient if rubbed in gently before the fire. If the stomach is very irritable, it is often difficult to select any internal medicine which will suit it; but in most cases the following will be beneficial in allaying vomiting:—

Take of Diluted hydrocyanic acid, minims xij.
Syrup of orange peel, ʒij.
Distilled water, ℥iij

Mix, and give a dessert or table spoonful every four hours.

Or, sometimes the following mixture will suit better:–

Take of Diluted sulphuric acid, ʒj.
Syrup of poppies, ʒiss.
Cinnamon water, ʒij.
Water, ℥iss.

Mix, and give as above directed. Occasionally, if the inflammation runs very high, nothing will allay it but calomel, which must be given in powder as follows:—

Take of Calomel, gr. iij.
Powder of chalk and opium, gr. xviij.

Mix, and divide it into six powders, one of which is to be given three times a day. If the bowels are costive, a mild aperient, consisting of castor-oil, or rhubarb and magnesia will be necessary; or if, on the contrary, the bowels are relaxed, they must be treated with astringents, as described at par. 1050.

1049. The diet in all the various affections of the mucous membrane of the intestinal canal, should be of the blandest nature, consisting chiefly of farinaceous articles, made up with milk, and varied according to the condition of the bowels, using arrowroot if they are loose, and oatmeal if at all confined; solid food must be postponed until the convalescence is completely established.

1050. Diarrhœa and Dysentery (page 53) are very common, and the former is to be looked for at some period or other, in the rearing of almost every child born in this country. In most instances it may be attributed to improper food, and then a dose of rhubarb and magnesia will be useful, by getting rid of the irritant cause, after which the effect ceases of its own accord. If, however, diarrhœa is not connected with this injudicious kind of feeding, it may be relieved by one or other of the following remedies, the former of which acts by soothing the mucous membrane, and correcting the acidity of the secretions, while the latter is a direct astringent and tonic:—

Take of Comp. chalk-mixture, ℥iv.
Aromatic confection, gr. x to xv.
Syrup of poppies, ʒj to ʒij.

Mix, and give a dessert or table-spoonful after every loose motion;

Or, Take of—
Diluted sulphuric acid, ʒij.
Syrup of poppies, ʒij.
Water, ℥iiss.

Mix, and give as above. If there is a great deal of straining, and the child is more than three years of age, 4 or 5 grains of the compound ipecacuanha powder may be given every four or five hours; or the following injection may be thrown up into the rectum with an ear-syringe, taking care to hold a warm towel or handkerchief firmly against the *anus* afterwards, to counteract the child's instinctive desire to strain, and thus return the injection:—

Take of Warm decoction of starch, ℥j to ℥ij.
Laudanum, from x to xxx drops.

Mix, and throw up gently. In using this, the best plan is to fill the syringe from the cup of starch, then return this into another clean cup, pour into it the laudanum, stir it up, and again fill the syringe, which is now to be used at once. By this plan all the laudanum is injected.

1051. In the Discharges from the Vagina, to which weakly children are subject, the treatment must always be directed to relieve the general symptoms, as well as those locally affecting this passage. A strong solution of alum in water may safely be used as a wash, or an infusion of green tea made as for drinking. Sometimes the discharge is very profuse, and the inflammation of an active character; but this is not often met with, and when it does occur, is a mark of having caught cold, in an inflammatory subject, and will subside in a few days by the adoption of cooling measures, such as a warm-bath, followed by an active aperient, and the accompanying mixture:—

Take of Nitrate of potass, gr. xx.
Bicarbonate of soda, gr. xxx.
Mixture of gum acacia, ℥ss.
Tincture of henbane, ʒij.
Spirit of nitric ether, ʒij.
Syrup of saffron, ʒij.
Camphor mixture, ℥iij.

Mix, and give a table-spoonful every four hours.

1052. Ranula (see par. 166) is not uncommon in the child, but in all cases it should be treated by a surgeon, who will avoid doing injury to the important vessels lying so closely beneath this part.

Sub-Sect. B.—Treatment of Inflammations of the Skin and its Appendages.

1053. On the Proper Treatment of the Skin and Hair in childhood the future appearance of both will in great measure depend; and it is, therefore, of great importance that the mother or nurse should attend to them with great care. As the follicles of the hair, and those which secrete the oily matter which lubricates the skin, coalesce and form only one orifice, it may readily be understood that whatever impedes the regular secretion of the one, acts also upon the other. Unless the skin is kept in a healthy state, and its epidermis is removed by friction or ablution, the hair can with difficulty protrude from its seat or follicle, and as a consequence it is dwarfed, or even deformed, by being twisted on itself as it lies confined in its course through the skin. It also explains the effect of stimulants upon its growth, which, though denied by some people, is too clearly the case to be disputed. Grease, in all its varieties, is no stimulant, though it aids the growth by allowing the hair to escape from its follicles; whatever is a stimulant to the skin has a similar effect upon the hair, the vessels of the skin itself and of the hair follicles being closely connected. Hence it is, that whatever blisters the skin will, in a less dose, stimulate the hair follicle to secretion, such as turpentine, cantharides, or ammonia. Soap is generally injurious, from its removal of the oily matter of the hair; but in some cases, when there is a quantity of old and tough epidermis matted with the contents of the sebaceous follicles, and obstructing the growth of the hair, nothing else will liberate it from this injurious thraldom. For young children it should never be used in those cases when plenty of water is likely to be employed; but if the head is not *regularly* washed every day, soap will rather be beneficial than otherwise; for it will only remove enough of these impeding materials without entirely destroying the secretion of oily matter, or rendering the hair too dry and brittle. I am quite sure, however, that with proper cleanliness, the hair ought never to be touched with soap, egg, or any other solvent of oil. Nevertheless, as I said before, if this daily washing is not practised, and in the long hair now worn by girls it scarcely can be, an occasional washing with the yolk of egg is beneficial. Next to ablution comes friction, which acts in the same way, and when not too violent is very efficacious; but when employed through the medium of a sharp-toothed comb, or a very penetrating brush, which is improperly used, it is mechanically injurious by leaving the true skin bare of its covering, and causing it to become inflamed. Few people use a brush in a proper manner, either upon their clothes or their heads. The first thing they do is to drive it into the skin in a perpendicular direction, which necessarily causes an injury to its structure when followed by a rough thrust in a lateral direction. But if carefully used, the brush ought to be pushed into the hair *at an angle with the surface of the skin*, and as soon as it reaches that surface it should be kept from irritating it more than enough to raise any loose particles of epidermis. It is of no use to attempt to prevent this abuse of the brush, by allowing the use only of soft bristles, because such a material will not, and cannot, be made to enter a curly or stubborn crop, and is, therefore, quite inefficient. The error is in the hand, not in the tool, and this should be fully understood. It is a pleasure to be manipulated in a scientific manner by a master of the hair-brush; and I know few more painful moments in the ordinary affairs of life than the clumsy attempts at brushing made by an ignorant hairdresser. From these remarks it may be understood—1st, that the follicles of the skin are by nature intended to lubricate each hair as it passes out, and when in a healthy state sufficiently so to serve it in its whole length; 2nd, that soap and egg only remove that which is intended by nature to supply a want of the hairy covering; 3rd, that stimulants may be made to encourage the growth of the hair *directly*, while oily matters only *permit* its escape from its previous thraldom; 4th, that plain water or friction are the only means necessary for keeping a healthy crop of hair in a proper state, but that a neglected scalp may require soap or yolk of egg.

1054. WITH REGARD TO THE OILY MATTER required by the hair, it should be of such a nature as to remain liquid in the open air. Vegetable oils rapidly lose the fluid portion of their contents, so that in a very short time the hair is left in a worse state than before, because it is no longer moistened, and, in addition, it has a fresh layer of sticky and clogging matter. If oils are to be employed, they should be composed of animal fats, such as horse-fat, which is largely used, though not acknowledged by the vendors, trotter oil, or neat's-foot oil, all of which part with their fluid contents with great reluctance. The two latter may always be obtained in a greater or less state of purity, and the trotter oil in particular when pure, is a most valuable addition to the articles of the toilet. Of course they may be scented with any favourite essential oil, all of which are slightly stimulating, and therefore advantageous rather than otherwise. Olive oil and almond oil, so generally used for the hair, are not at all calculated for the purpose to which they are devoted; and even when mixed with the hard animal fats, such as lard, or suet, they are too drying in their nature. Lard, when unmixed with flour, is by no means objectionable; but it is so often adulterated with that material, that it is right to melt it, and allow the flour to fall to the bottom, before using it for this purpose. Suet is in itself too hard, but it may be mixed with any of the animal oils to make pomatum with advantage.

1055. BY CUTTING THE HAIR, whether with the scissors, or the razor, its growth appears to be accelerated, though in what way it is difficult to show. When the razor is used, it is applied so near to the bulb, and removes so completely any foreign matter impeding the exit of the hair, that we can readily see how it may affect the question; but this is not the case with the scissors when applied to the long hair of the female sex; and yet we are constantly told, that their use to the tips of what the ladies call "back hair," causes an immediate effect on its growth. The belief is so general, that we ought not to dispute it, and I am by no means inclined so to do; but I suspect that the effect in preventing the split-ends from being broken off, is greater than upon the growth from the root. All hair when once cut becomes broken into two or more fibrous extremities; and these being fine and delicate, are easily removed from the thick and still whole body of the hair—by which the growth appears to be checked, though it may all the time be going on steadily. But supposing no removal of their broken ends, and the growth to go on, there will be an evident increase, because there is no loss at the one end to counter-balance the growth at the other. Such is evidently the effect of cutting upon the coarser hair of the tails of horses, and possibly the same may take place in the soft hair of our female partners in creation. But in whatever way the cutting of the hair may act, there can be no doubt, that it does improve the length and strength; and after once being adopted for children's hair, it should afterwards be repeated at short intervals, in order to avoid the splitting of the ends mentioned above.

1056. In those diseases of the skin, or of the hair itself, which occur in childhood, and cause a loss of this ornament and protection, stimulating applications will generally reproduce it. These diseases are *porrigo* (par. 196), and the peculiar baldness in patches described at par. 219, under the name of *alopecia circumscripta*, though formerly considered to be a variety of *porrigo*, and termed *porrigo decalvans*. After the cure of the true porrigo the hair gradually grows again, but often it is very weak, and would never recover its full strength if left to the efforts of nature alone. It is better to wait for two or three months in order that the skin should quite recover itself, and then the following application may be used three times a week:—

Take of Powdered cantharides, ʒij.
Spirit of turpentine, ʒiv.

Mix in a phial, and let them stand together for a fortnight, shaking them every day. At the expiration of that time strain off the turpentine, and add an equal quantity of neat's-foot oil. If the skin is very delicate, the quantity of oil must be doubled. It may be scented with twenty or thirty drops of essence of verbena, which covers the smell of turpentine better than any other scent. This application is equally useful in the form of baldness, described at par. 219, and alluded to above as *alopecia*.

1057. THE FINGER-NAILS of children require constant cutting, or they will break and become distorted. It is not wise to cut them quite close to the quick, as the end of the finger becomes clubbed in consequence. They should also be cut round, and well out at the corners, whereby the convexity of the surface is preserved, which is considered a beauty. The towel should always be used to rub back the cuticle at the root of the nail, which otherwise grows over it, and makes the nail look short and square.

1058. IN CUTTING THE TOE-NAILS on the contrary, the corners should on no account be cleared out, but the nail should be cut straight across, or rather scooped out in the middle. In consequence of the pressure of the shoe, the toe-nails always have a tendency to grow in at the corners; and, without the above precaution they almost always do so; and, as they are out of sight, the appearance of the nail is of no consequence whatever.

1059. WHEN THE TOE-NAIL has been thus curved in, and has produced inflammation and ulceration, the disease is very difficult of cure, without the removal of the nail. A skilful surgeon may, perhaps, succeed in restoring the nail to its natural growth by scraping the middle with glass until it is very thin and flexible, and then bending out the corner, taking especial care not to break it. There is generally a fungus growing out of the corner, which must be destroyed by lunar caustic, so that the case is generally beyond the management of any one unskilled in surgery. A small piece of lint-scraping, or of carded cotton, is also to be placed under the edge of the nail which has been lifted out of its bed in the fungous growth; and in this way the nail is prevented from acting as a constant source of irritation, while the lint serves as a means of pressure on the fungus. By far the best plan, however, (now that chloroform can be used to avoid the pain) is to remove the nail altogether; after which the fungus shrinks away and the ulcer heals; and, as the new nail grows up, by cutting it properly, as above directed, the return of the growth inwards may always be prevented.

1060. WHITLOWS are most painful abscesses connected with the nails, though one kind—the *deep* whitlow, is entirely confined to the *bone* of the last joint of the finger, and has nothing to do with the nail. In the *nail whitlow*, matter either forms round the root of the nail, appearing under the cuticle, where it shows itself by its yellow colour, or else it forms more deeply at the corners, and is very commonly produced by drawing out what is called a "hang-nail," or "ad-nail." In this last case the throbbing and pain are very severe, and they may be generally relieved by separating the skin from the nail at the corner without cutting. By doing this cautiously, yet deeply, a small drop of matter will make its appearance, to the great comfort of the sufferer; and though it forms again two or three times, it may as often be let out without inconvenience. The matter poured out round the root merely requires the cuticle to be snipped and *removed* with the scissors, as if this is left behind it irritates the ulcerated surface; indeed it will always be found that thick cuticle or nail, when in contact with an ulcerated portion of skin, adds to the existing inflammation, and acts almost like a poison.

1061. THE SKIN DISEASES most commonly met with at this age, and some of them almost peculiar to it, are the following, viz.:—

(*a*) Erythema and erysipelas.
(*b*) Roseola (*rose-rash*).
(*c*) Nettle-rash.
(*d*) Herpes (*in its various forms*).
(*e*) Eczema.
(*f*) Scabies (*itch*).
(*g*) Pemphigus and pompholyx.
(*h*) Porrigo (*scall'd head*).
(*i*) Impetigo (*crusted tetter*).

IN THE TREATMENT of these eruptions, it is almost always necessary to attend to the constitutional disorder which generally precedes and accompanies them; but sometimes, as in the case of scabies, the cause is independent of all such combination, and then the local remedy is all that is required. The following directions combine the most easily managed methods of cure in these troublesome accompaniments of childhood.

(*a*) IN TREATING ERYTHEMA, when of the most ordinary kind, as described at page 59, nothing more is necessary than to use the greatest cleanliness, and, at the same time, while preventing the contact of the irritating discharge which usually produces the eruption, giving some cooling medicine of a slightly aperient nature. But in the form known as *erythema nodosum*, and also alluded to at the same page, a very different plan must be adopted. This is essentially attendant upon a debilitated state of the system, and will require strengthening medicine and nourishing food for its removal, together with a change of air, if possible, to a bracing kind, and if the sea-side can be attained, so much the better—that is to say, if the season of the year is propitious. The following mixture will often agree well in this eruption:—

Take of Wine of iron, ʒij.
Comp. tincture of valerian, ʒvj
Infusion of rhubarb, ℥j.
Peppermint water. ℥vj.

Mix, and give from a dessert-spoonfu to two table-spoonfuls three times a day;

Or, take of—
Sulph. of quinine, gr. viij.
Tincture of cardamoms, ℥ss.
Diluted sulphuric acid, ʒj.
Infusion of roses, ℥viiss.

Mix, and give one or two table-spoonfuls three times a day, No local application is of the slightest use in this form of erythema. With regard to the treatment of erysipelas at this age, it is the same as in the adult.

(*b*) THE ROSE-RASH (par. 176) scarcely requires any treatment further than a diminution in the amount and quality of the food, and a gentle aperient unless the bowels are already relaxed, when nature may be left to herself. If the rash persists for more than three or four days, the following simple mixture may be of service, and can do no harm:—

Take of Diluted sulphuric acid, ʒiss.
Infusion of rhubarb, ℥j.
Infusion of gentian ℥iij.
Water, ℥iv.

Mix and give one or two table-spoonfuls two or three times a day.

(*c*) NETTLE-RASH (177) is sometimes a most obstinate and irritating infliction upon the patience of children; but generally it yields *at this age* very readily to a mild aperient following a warm bath at a temperature rather lower than usual, that is, not above

96° or 98° F. It is very apt to occur in children during warm weather, and especially if they have been stung by *ants*, or infested with that troublesome little insect the *harvest-bug*. When the cause is so palpable, it may be scarcely necessary to attend to it further, than to prevent its recurrence, if possible, but when the eruption appears to depend upon the blood of the child being in a condition rendering it prone to such outbreaks, it will be well to give the following cooling mixture every morning, or the drink afterwards prescribed:—

Take of Sulphate of magnesia, ʒij to ʒiv.
Solution of carbonate of magnesia, ℥ss.
Spirit of nitric ether, ʒij to ʒiij.
Camphor mixture, ℥v.

Mix, and give a dessert or table spoonful three times a day;

Or, take of—
Sulphate of magnesia, ℥j.
Bitartrate of potass, ℥ss.
Fresh lemon peel, ℥j.
Sugar, ℥iij to ℥iv.
Boiling water, ℥xiv.

Mix, and give two or three tablespoonfuls every morning.

(*d*) Herpes, in all its various forms, indicates an inflammatory condition of the blood, which requires lowering food, if not medicine in addition. In that form known and described at page 62 as *herpes labialis*, or the ordinary "breaking-out" about the mouth, face, and ears, there is almost always some accompanying fever and disorder of the stomach, which require remedies in themselves sufficient to effect a cure of the eruption attendant on them; and it may therefore be left to take its own course, with the caution to prevent the child using its nails, and thereby leaving an ugly scar. Greasy local applications should always be avoided; and if it is necessary to apply anything to the part, in order to prevent the contact of the child's nails, the best is a bread poultice put into a bag of fine muslin. In *herpes zoster*, known as *shingles*, and also a common eruption in children, greasy applications are also to be avoided. The best plan is to foment the inflamed part well with warm water, at as high a temperature as the child can bear, and leave the skin protected by a soft old muslin handkerchief, which will stick to the vesicles as soon as they burst, and serve as a guard against the friction of the clothes. The warm water allays the irritation, which is a source of great annoyance to the child. If the eruption occurs in a strong and plethoric constitution, the mixture given at (*c*) may be used; but very often it makes its appearance in a delicate little child, of a fair complexion and scrofulous habit, and then the following will be more suitable; as soon as the tongue is tolerably clean.

Take of Diluted sulphuric acid, ʒss.
Sulphate of quinine, gr. ij.
Syrup of orange peel, ʒij.
Tincture of henbane, ʒij.
Water, ℥j.

Mix, and give one or two tea-spoonfuls twice or thrice daily. For the *ring-worm* (*herpes circinnatus*), as well as in *herpes capitis*, a local application of nitrate of silver or sulphate of copper is the best plan to be adopted, the latter being the most manageable in domestic hands. A piece of the bluestone (sulphate of copper) is to be wetted and rubbed into the *outer* edge of the circle, not using any force, but taking care that it does actually come in contact with the sound skin around the vesicles, which is the part chiefly to be treated; as by stimulating it, the spread of the eruption is prevented, and the vesicles already in existence get well as a matter of course. If this plan is adopted every second or third day, it will be found that the ring-worm has disappeared within a week or ten days at furthest, especially if in the meantime the general health has been attended to by giving a mild dose of rhubarb, or calomel and rhubarb, or rhubarb and magnesia, according to circumstances, and following this up with the use of some one or other of the strengthening mixtures given below, viz.:—

Take of Sulphate of quinine, gr. viii.
Diluted sulphuric acid, ʒj.
Syrup of orange-peel, ʒij.
Compound tincture of bark, ℥ss.
Infusion of roses, ℥vij.

Mix, and give one or two table-spoonfuls three times a-day;

Or, take of—
Wine of Iron, ʒij to ʒiij
Infusion of calumba, ℥viiss.

Mix, and give one or two table-spoonfuls three times a-day. If the bluestone does not effect a complete cure, it may be necessary to try a stronger application by means of nitrate of silver, as follows:—

Take of Nitrate of silver, ʒss.
Distilled water, ℥j.

Mix, and form a lotion, which is to be brushed into the ring-worm with a camel-hair pencil every other day.

(*e*) ECZEMA, at this age, shews itself not uncommonly on the body and face; but it is not peculiar to this period of life in appearance or treatment, (the latter, given in the next book.) One form, however, known as *crusta lactea*, attacks the face of the child only, and never appears later in life. Nevertheless, as this is the only exception, its consideration may well be postponed to the next part.

(*f*) THE ITCH (*scabies* or *psora*) is not common among the middle classes except in children, who occasionally contract it by the carelessness of servants, in suffering them to mix with strangers having the complaint. When its presence is detected by the symptoms described at page 64, the sooner the proper remedies are applied the better. For this purpose it is advisable to confine the child entirely to bed for three days, putting on an old night-gown, which may afterwards be burnt During this time about an ounce (or rather more, if the age is greater than five or six) of the compound sulphur ointment is to be rubbed into the whole body (with the exception of the face, which is always exempt) every night, and no washing should be allowed, so that the sheets and night-gown become thoroughly permeated with the greasy application. After the expiration of the third night, the child may be allowed to get up, and it is then to be put into a tub of warm water and well washed all over with a good lather of soap, after which it may be dressed in clean things, and on going to bed should have everything fresh. It will be found that by this time the inflammation around the vesicles or pustules has almost entirely subsided, though they may not be quite healed over, and the troublesome itching has also disappeared, so that the child sleeps comfortably without scratching, as it was previously compelled to do. Sometimes, however, there is a slight return from the circumstance of the ointment having failed to reach some cleft or wrinkle in the skin about the joints, and it is well on that account to watch carefully in these situations for some little time, and to apply a little of the ointment to every *fresh* vesicle which shows itself. If this remedy is properly applied, and the disease is really *scabies* caused by the presence of the *acarus* described at page 65, the above treatment will never fail to eradicate it in the time mentioned above. Sulphur given *internally* is supposed by some people to be sufficient for the purpose, and so it may be in the course of time; but no one would like to wait during the weeks, or even months, which would be required for the purpose. All other local remedies which will effect a cure are of too dangerous a nature to be used safely by the mother of a family, but the above may be fully relied on as an innocent, yet fully effectual, method of cure. A dose of any common aperient medicine will aid in cooling the blood, and in carrying off the sulphur which has been absorbed into the system.

(*g*) PEMPHIGUS AND POMPHOLYX (page 66) are both evidences of debility, and demand a more strengthening diet, and tonic medicines in most cases. Change of air will also be serviceable, and especially from a relaxing and low situation to a high and dry air, or to that of the sea-side. The secretions should first be attended to, taking care in particular that the liver is acting properly, and then the following mixtures will usually do good; but the case will almost always demand the careful superintendence of an experienced physician.

Take of Citrate of quinine and iron, ʒss.
Bicarbonate of soda. ʒij.
Tincture of cardamoms, ʒij.
Syrup of orange-peel, ʒij.
Water, ℥vss.

Mix, and give two table-spoonfuls three times a day with one of lemon juice, or half the quantity of each to a young child.

(*h*) PORRIGO, or *scall'd head* (see par. 196), is generally associated with a feeble condition of the system, which must be attended to, or the local applications will be wholly useless. For this purpose, nothing answers better in the usual way than the old-fashioned powder of cinchona (*bark*), half a tea-spoonful of which may be given with a little port wine twice a day, or the following mixture:—

Take of Compound tincture of cinchona, ℥j.
Decoction of yellow cinchona, ℥xj.

Mix, and give two or three table-spoonfuls thrice a day. Sometimes steel is required, and then the following will perhaps agree:—

Take of Wine of iron, ʒij to ʒiij.
Compound tincture of valerian, ℥j
Water, ℥viss.

Mix, and give one or two table-spoonfuls three times a day. The local treatment is, however, that upon which the cure must in the main depend; and here the first thing to be done, is to get at the root of the disease, so as to enable the remedy to reach it. Hence it is often a cause of failure that the hair is left on, and as it is always matted together into one large scab, there is no little difficulty in removing it. Some have resorted to the barbarous expedient of putting on a pitch-plaster, which adheres so firmly that in removing it all the hair is extracted by the roots and the head is left bare. This, however, is quite unnecessary, and the great pain attending it will always prevent its adoption. The best plan is to apply a large linseed-meal poultice over the whole head for some hours, keeping it moist by an oil-silk cap over it; and at the expiration of that time, the scab will be rendered so soft, that by the aid of scissors the whole of it, with the hair included, may be removed. It is best to begin at one edge and run the scissors along, so as to cut a row of hair a quarter of an inch broad; then another, and another, turning up the scab as progress is made, until at last the whole diseased surface is laid bare, with short hairs standing up all over it. If the inflammation is now found to be very great, and the surface is raw and inflamed, the poultice may be re-applied, and continued for a few days; and if so, it is a good plan to sprinkle over it some powdered charcoal, which acts the double part of correcting the smell and soothing the irritation. In a few days the following ointment may be used, first of all under the poultice and afterwards spread on lint, and covered with an oil-silk cap to prevent the formation of hard scabs, which interfere with the future application of the remedy:—

Take of green Iodide of mercury, ʒj.
Lard, ℥j.

Mix, and apply night and morning;
Or, take of—
Pure carbolic acid, grs. iij.
Water, ℥j.

Mix, and use night and morning, carefully brushing on with a camel-hair pencil. After the ointment has been on for twelve hours, the head should be washed with a pint of hot water, containing a drachm of carbonate of potass, which is better than soap for the purpose of removing the ointment, and thus enabling each fresh supply to reach the diseased surface. The iodide of mercury is the most complete specific in this disease if persevered in; but a change to the second ointment, for a day or two, will often assist the progress of the cure. By some the iodide of sulphur, or that of lead, is preferred; but, after trying each, I am satisfied that the iodide of mercury is the most effectual. Nevertheless, if it appears to fail, the ointment of the iodide of lead, or of the iodide of sulphur, may be tried in the same way, and of the same strength as the above. If the inflammation of the surface appears to be very much increased at first by the use of the iodide of mercury, the following application may be tried for a short time, and then the iodide will perhaps be borne :—

Take of Carbonate of potass, ʒj.
Glycerine, ℥j.

Mix, and spread over the head by means of a soft brush, covering all up with linen and an oil-silk cap. For the first two months, the hair must be kept as short as possible, by clipping it weekly with scissors; but at the end of that time if the skin looks tolerably sound, the hair may be suffered to grow, still using the iodide of mercury or lead in small quantities, and rubbing it well, but gently, into the roots, by means of a piece of lint wound round a short stick, and carefully watching for any return of the peculiar scabs, on the first appearance of which the hair must be cut short again, and the remedy daily applied. I have never required more than two months cropping of the hair, but in some cases I have found it necessary to keep up the regular application of the iodide two or three times a week for three or four months; and, indeed, I should always continue it until the healthy appearance of the hair indicates that the disease has entirely ceased. Severe caustics have been considered necessary to the cure of this disease by many surgeons, and I believe were almost indispensable in some cases prior to the introduction of the iodide ointment; but now there can be no question that they are no longer needed, and the use of them is altogether abandoned. For the treatment of *porrigo decalvans*, see page 309.

(c) Impetigo, or *crusted tetter* (see page 69) requires both general and local treatment; but though by the accomplished physician it is more easily cured than *porrigo*, yet the varieties in the exact condition of the parts are so great as to tax the efforts of the inexperienced observer very severely. There is a general necessity for cooling remedies, such as a saline aperient of the following kind :—

Take of Bicarbonate of soda, ʒij.
Sulphate of soda, ʒvj.
Tincture of conium, ʒiiss.
Sugar, ʒij.
Water, ℥ivss.

Mix, and give two table-spoonfuls three times a day, with one of lemon-juice, or in young children half the quantity of each. If there is no feverishness, but, on the contrary, there is much debility, the following mixture may be judiciously employed :—

Take of Iodide of potassium, ʒj.
Decoction of yellow bark, ℥xiss.
Spirit of nitric ether, ʒiij.

Mix, and give one or two table spoonfuls three times a day. The local application most suited to allay irritation is the following:—

Take of Diluted hydrocyanic acid, ʒij.
Glycerine, ʒiij.
Water, ℥viiss.

Mix, and apply with a brush night and morning. Sometimes the above will be sufficient to cure the disease when united with general remedies; but if not, the following ointment may be tried :—

Take of Zinc ointment, ℥j.
Sulphur ointment, ʒj.
Ointment of nitrate of mercury, ʒss.

Mix, and apply every morning after well bathing with potash water (see page 313.)

1062. Mother's Marks, if they begin to grow troublesome at this age, as they often do, should be immediately placed under the care of the surgeon.

1063. Chilblains are particularly troublesome during this period of life, and are often so painful as to prevent the child from taking exercise if on the foot, or from using the hands if on that part. Many mothers compel their children to use cold water, with a view to harden their skins, and thus prevent these distressing inflictions; but the plan is a bad one, and only aggravates the mischief it was intended to avoid. The most likely preventive is the regular use of stimulating applications, such as spirit of turpentine, either pure or mixed with oil in equal quantities, or the two united with the liquor of ammonia in equal proportions. This last forms an excellent application, either to the skin when chilblains are threatened, or to the chilblain itself in the early stage, before it is much swollen. The disease at first consists in a true congestion of the vessels, which is sometimes followed by inflammation and ulceration, and nothing but a strong stimulus will accelerate the blood in its passage through the small vessels. In this way snow acts when rubbed in, though cold without friction would only aggravate the disease. After they are broken, the best application is the ointment of nitric oxide of mercury spread on lint, and kept constantly on the part; or if there are white patches on them, which are *sloughs*, a poultice of linseed-meal may be required until they come away, when the above ointment may be used with advantage.

SUB-SECT. C.—TREATMENT OF INFLAMMATION OF THE CELLULAR MEMBRANE.

1064. At this age there is no particular inflammation of the cellular membrane prevalent, excepting in scrofulous subjects, in whom abscesses in that part are exceedingly common. Still they belong rather to that disease than to the subject we are now considering, and will be examined into under that head. Pneumonia is common enough in childhood, but its treatment scarcely differs from that of the adult. Prior to the age of six, it is seldom met with, except in union with bronchitis, and its treatment requires at that age some little modification, but after six or nine, pneumonia is seen as often as in the adult, and may, indeed, be treated exactly in the same way.

1065. PNEUMONIA, between two years of age and six, should almost always be treated at the onset by the abstraction of a small quantity of blood by means of one or two leeches, followed by a small blister, carefully watched and dressed (see pars. 947 and 976.) Conjointly with these remedies, a full dose of antimony will usually be required, and the following mixture may be employed advantageously:—

Take of Antimonial wine, ℥ss.
Spirit of nitric ether, ʒij.
Comp. tincture of camphor, ʒij.
Water, ℥v.

Mix, and give one or two table-spoonfuls every four hours. If there is any doubt of the extent of the pneumonia, and if the bowels are irritable, or are already much relaxed, the wine of ipecacuanha may be substituted for the antimony; but though it relieves bronchitis quite as well, it has not the same control over pneumonia. If the bowels are confined, and especially if the liver is not acting, a dose or two of rhubarb-and-magnesia (page 268), with one or two grains of calomel, should be given at intervals of two or three days.

SUB-SECT. D.—TREATMENT OF THE INFLAMMATIONS OF SEROUS MEMBRANES.

1066. HYDROCEPHALUS, although often considered to be purely an inflammation of a serous membrane (see par. 237), will be treated of under *disease of the brain.*

1067. PLEURISY AND PERICARDITIS in the child do not require different treatment from the same diseases in the adult, except in the *doses* of medicine.

1068. ACUTE PERITONITIS IN THE CHILD (see par. 249), must always be treated by the local, or sometimes even general, loss of blood. Leeches to the number of two, three, or four must be applied to the abdomen, followed by a large poultice of bread or linseed-meal; and, at the same time, it will generally be expedient to give small doses of calomel and opium, as follows:—

Take of Calomel, gr. iv.
Pow. of chalk and opium, gr. xl.

Mix, and divide into eight powders

and give one three times a day, or to a very young child half a powder. If the bowels are confined, castor-oil must be given in sufficient doses to act gently, but not so as to purge violently. Its action should generally be assisted by the use of an enema of gruel, containing half an ounce of castor-oil. When the leech-bites have ceased to bleed, and the inflammation seems to be still unsubdued, some *warm* spirit of turpentine should be sprinked on hot flannels and applied to the abdomen, which will act as a counter-irritant, and relieve considerably. Sometimes, however, a blister will be necessary, and though painful in this part from the difficulty of moving without increasing the soreness caused by it, it is yet in many instances a most desirable means of relief. This disease, like many others which have been alluded to, is of such a nature, that it really demands the best medical aid which can be obtained; and here, as elsewhere, these remarks are only intended to serve in the absence of such assistance.

1069. CHRONIC PERITONITIS in the child (see par. 252) is of so fatal a character, that it is useless to attempt giving any directions here which are likely to be of the least use. Moreover, its attacks are so slow as always to afford time for calling in medical aid somehow or somewhere.

SUB-SECT. E.—TREATMENT OF MUSCULAR AND FIBROUS INFLAMMATIONS.

1070. CRAMP is very often troublesome in childhood, and nothing but friction is of the slightest use.

1071. COLICKY PAINS in the abdomen (par. 274) are a constant source of annoyance to children, chiefly owing to the use of improper food. A warm aperient like the following will generally set matters to rights:—

Take of Tincture of rhubarb, ʒij to ʒiv.
Syrup of poppies, ʒss to ʒi.
Peppermint water, ℥ss to ℥j.

Mix, and give as a draught, which is to be repeated in six hours, if the first has not acted by that time.

1072. HICCUP (par. 275) may generally be stopped in children by suddenly taking their attention by means of some sharp sound, or by amusing or diverting them by a novel object. If this fails, give the child some finely-powdered white sugar to swallow by small portions at a time, and instructing it to do this without waiting for its solution in the mouth. The effort to effect this, in opposition to the natural dryness of the powder, will almost always stop the hiccup, and I have rarely failed with this simple remedy.

1073. ACUTE RHEUMATISM, though rare, occurs sometimes at this age, and may be treated just in the same way as later in life, though with diminished doses of medicine.

SUB-SECT. F.—TREATMENT OF THE INFLAMMATIONS AND CONGESTIONS OF THE GLANDS AND ABSORBENTS.

1074. CONGESTION OF THE LIVER (both active and passive, which are described at page 99) continually occurs in the child at all ages. This arises more especially from the excess, both in quantity and quality of the food, which young people are supplied with, in proportion to the amount of exercise which they take. If they are allowed to run about a good deal, and have consequently the ravenous appetite proper to their age, they require plenty of nourishing food, but not of a highly stimulating nature, and if it is allowed to be of this latter kind, the liver becomes actively congested from being called on to do an unnatural amount of work, and as a consequence, secretes an enormous amount of bile, which irritates the bowels, producing diarrhœa, and very often vomiting of bilious fluid accompanied by a slight degree of fever. It appears, indeed, as if nature had established this check as a kind of safety-valve, which should cut off the supply, for it always happens that the appetite suffers, and food is disgusting for the time during which the attack lasts. On the other hand, passive congestion, accompanied with a cessation of the secretion of bile, is commonly met with in children who take little or no active exercise, being of a sluggish temperament by nature, and disinclined to exert themselves. Such children are often capricious in their appetites, and their mammas and papas are too apt to tempt them to eat rich delicacies, which are totally unfit for the stomachs of the child, the consequence being that the digestive apparatus is overdone, and the liver refuses to act at all, thus increasing the original mischief by the want of the proper stimulus of bile to the small intestines. Here, then, is an instance in which, by removing the cause, the effect ceases, and nature compels its removal for a short time by withdrawing the appetite for food. It is, therefore, only necessary in the case of active congestion to feed the child on lighter and more easily digested food, avoiding all medicine as unnecessary, and, in fact, prejudicial. If the diarrhœa is ever so severe, *provided it is accompanied by a free secretion of bile*, it may be suffered to run itself out without medicine, taking care to give the mildest kind of food, such as milk, arrowroot, or rice-milk, or sago, or tapioca pudding, with rice-water for drink. But where there is evidence of passive congestion, as marked either by constipation from a want of bile, or by diarrhœa, produced from the irritation of badly digested food, in consequence of its absence, the liver will often require the stimulus of some medicine before it will begin to act. An emetic has a wonderful power in unloading a congested liver, and I believe that the sickness, so common in children, is nature's way of effecting her curative process. Vomiting seems to act chiefly by forcibly compressing the liver; but it also probably relaxes the mouths of its biliary ducts, and thus doubly aids in the production of the result which is so essential to a recovery of the general health. But though an occasional emetic (once a year or so) will not weaken the stomach of the child, yet if resorted to very frequently, it would certainly unload the liver; but, at the same time, it would do quite as much harm as good by its injurious effects upon the stomach; and, unfortunately, it happens that these attacks, when they occur once, are apt to be reproduced through a continuance of the same foolish indulgence of the appetite. It is, therefore, necessary to consider whether this remedy or a mercurial aperient is the better; or rather, perhaps, it may be asked—which is the least injurious? and I am inclined to think that, of the two, the latter is to be preferred. Nevertheless, it is quite clear that, by proper management, even after the congestion is produced, both may in many cases be avoided, the chief difficulty being to regulate the food in the only way in which it can be made to serve instead of medicine—that is, by giving so little as to cut off the supply of blood to the liver, and thus in course of time bring down its overgorged vessels to a proper standard of fulness. But in this way the child loses flesh rapidly; and though it may ultimately be the stronger for it, yet few mothers are content to wait for months to see their children looking well and healthy, and especially such mothers as usually compose the class who supply their children with the food likely to produce the disease I am now discussing. Nevertheless, it should be known, that there is no absolute necessity for medicine in such cases, and that though its administration may be the most rapid mode of producing a change for the better, yet it is not the most lasting nor the most satisfactory in its ultimate result. In no class of diseases has homœopathy been productive of so much good as in those dependent on the disorders of the child's stomach; because it has really prevented that gross abuse of it which was formerly so much practised, by giving on every occasion dose after dose of strong mercurial aperients, whereas the homœopath amuses the mother by giving her his innocent globules to rely upon; while at the same time he compels a rigid adherence to a wholesome and proper diet, which alone is all that is wanted, but which, if ordered by the regular practitioner of medicine, would be discarded as a mark of incompetency. Often have I heard the remark—"Oh!

what is the use of medicine, if it can't cure without the aid of diet?"—and so the poor child is crammed with calomel and jalap, at the same time that it is tempted with plum-cake, or some other indigestible mass; and, as a consequence, the stomach is rendered more irritable with each succeeding attack. It may, therefore, be concluded, that *active congestion* requires no further treatment than a change of food from that kind which caused it, to a less stimulating one, such as arrowroot, or rice with milk, or tapioca or sago; while *passive congestion* will demand either an emetic, or a mercurial aperient, or such a long-continued system of low diet as will cut off the supplies, but with the attendant loss of flesh and strength, which is so trying to the anxiety of the mother. The following are the most useful forms in either case:—

FOR AN EMETIC—

Take of Ipecacuanha wine,
Antimonial wine, ā ʒij.
Water, ℥iss.

Mix, and give a dessert or table spoonful every quarter of an hour till full vomiting is produced, which is to be encouraged by a liberal supply of tepid water.

FOR A MERCURIAL APERIENT, either of the following will suffice:—

Take of Calomel, gr. j. to ij.
Powdered rhubarb,
,, jalap, ā gr. iij to vij.

Mix, and give in the morning;

Or, take of—
Mercury-with-chalk, gr. j to ij.
Powdered rhubarb, gr. ij to iij.

Mix, and give twice a day until the motions become bilious. In some children there appears to be a natural sluggishness of the liver, most probably inherited from parents who have themselves been mismanaged until this organ has been completely rendered inactive; in such cases the bowels are almost always costive, with pale clay-coloured motions, and a general want of vigour in the system. Much may be done in such cases by constant exercise in the open air, with friction of the right side, and the use of such diet as will have a tendency to act gently upon the mucous membrane, such as oatmeal and fresh fruits. But, in spite of all these aids, some children are so constituted that the liver still refuses to do its work, unless something more than this is done to aid it. Mercurials in small doses will always have a temporary effect, and may be tried for a short time in order to start the liver; but if long-continued, they do far more harm than good, and should never be persevered in for many weeks together. Here the only drug which will aid us without injury is ipecacuanha, which, when combined with rhubarb, has some considerable effect on the secretion of bile, and may be continued for an indefinite time. It should be given *with a meal* once or twice a day, so that it may aid in supplying the place of the bile if absent; while, at the same time, it has a tendency to cause it to be present. The dose is as follows:—

Take of Powdered ipecacuanha, gr. ⅓
to ½.
Powdered rhubarb, gr. j. to vj.

Mix, and form into a powder or pill, to be given once or twice a day, with breakfast or dinner, or both.

1075. ACTUAL INFLAMMATION OF THE LIVER, both acute and chronic, is very rare in the child; and when it does occur, may be treated in the same way as in the adult.

1076. JAUNDICE is also rarely found to occur in childhood, though a yellowish tinge of the skin is common enough. Should such a state of things be met with, it is high time that the best medical advice should be sought for.

1077. THE KIDNEYS are often congested at the age which is the subject of the present chapter, generally produced by a chill, or by some slight disorder of the digestive organs. If the latter is the cause, as soon as the stomach is set right, the kidneys begin as usual to secrete their healthy quantity of urine; but if they are congested from a slight cold or chill, they cease to act without any accompanying fever or general disorder of the system—the only symptom of any apparent consequence being the scanty quantity of urine secreted. Under such circumstances, from 30 to 50 drops of spirit of nitric ether in a little water will generally set all to rights, if repeated night and morning for three or four doses; *or*, if the organs continue obstinate, the following draught may be tried :—

Take of Nitrate of potass, gr. v to x.
Tincture of henbane, ʒss.
Spirit of nitric ether, ʒss to ℥j.
Spearmint water, ℥j.

Mix, and give two or three times a day, till the desired effect is produced.

1078. The Affection of the Kidneys, which is a sequel of scarlet fever, is treated of at page 302, under the head of that disease.

1079. Stone, Gravel, and other disorders of the kidneys, are to be treated at this age in the same way as in after life.

1080. Mumps (see par. 331) is a disease almost peculiar to this age, though occasionally met with in the adult. The swelling is to be treated by warm fomentations, and the application of flannel to prevent chilling in the interval; and on this material it is also useful to apply some stimulating embrocation, such as hartshorn-and-oil, or the compound liniment of turpentine sprinkled on it, and applied after the fomentation. (The formulas for these will be found at pages 236, 237.) If the swelling is very great, a few leeches may be applied, but they are seldom necessary. A light farinaceous diet should be given, and the bowels should be kept gently open by mild aperients. If the fever runs at all high, a simple effervescent mixture may be of use, consisting of soda and acid together with twenty or thirty drops of spirit of nitric ether in each dose. If the parotid gland is inflamed and swollen without the presence of the peculiar contagion of mumps itself, it is to be treated like any other inflamed gland at this or any other period of life.

Sub-Sect. G.—Treatment of Congestion and Inflammation of the Brain.

1081. Active Congestion of the Brain, sometimes called "irritation," is very usual in young children, apparently as a necessary consequence of the over-stimulation to which that organ is subject at this age, from the crowd of new impressions, and from its rapid growth, and consequent full supply of blood. The *symptoms* are enumerated at par. 350; and we may now proceed to the *treatment* which must always depend, in great measure, upon the state of the liver and other organs of the body. If they are deficient in action, it will usually suffice to set them going each by its own peculiar remedy, viz., by giving mercury in torpid liver, or diuretics in defective action of the kidneys (see last page). But if the congestion is independent of these causes, and is produced by excessive vascularity in a brain, which is, moreover, allowed to work too much, the remedy must consist in keeping it as idle as possible; while the body is kept cool, but not *too low*, by light diet, and perhaps a few doses of fever mixture. The food must not be of too lowering a kind, or mischief may be done by establishing a condition which is too apt to increase congestion rather than to diminish it. It should, therefore, be nutritious, but not of a stimulating kind—butcher's meat and fermented liquors being alike forbidden. Cold applications to the head may be used with good effect, consisting in sponging it with the following lotion two or three times a-day or simply with vinegar and water :—

Take of Spirit of wine,
Distilled vinegar, ā ℥j.
Camphor mixture, ℥x.

Mix, to make a lotion. While this lotion is being applied, the hair should be kept very short; and, indeed, whenever there is the slightest reason to suspect congestion of the brain, it can scarcely be cut too close. The feet should be put in very hot water every night, and at the same time the head should always have a good sponging of the above lotion.

1082. Passive Congestion is very apt to occur in the latter stages of various diseases of the child, as is evidenced by the fullness of the fontanelles when they are still unclosed, and by the stupor and heaviness which accompany this condition. It is often followed by effusion, which is a fertile cause of the fits that so commonly occur at this age. The *treatment* must be conducted on the principle of derivation—that is to say, as far as possible the blood must be drawn away from the brain without lowering the system unnecessarily. One or two leeches will generally be required to the temples; after which, the following may be given with a view of affording relief:—

Take of Calomel, gr. iss to ij.
Antimonial powder, gr. ij to iij.

Mix, and give every night, for three nights, to be followed next morning by the annexed draught:—

Take of Sweet essence of senna,
Sulphate of magnesia, ā ʒj to ʒiss.
Tincture of rhubarb, ʒiss.
Peppermint water, ℥j.

Mix. A blister may be applied to the back of the neck if the symptoms continue urgent, and mustard-plasters to the legs will also assist in drawing the blood from the head. If the symptoms continue urgent, give the following mixture during the day:—

Take of Nitrate of potass, ʒj.
Spirit of nitric ether, ʒiij.
Infusion of horse-radish, ℥viiss.

Mix, and give a table-spoonful every four hours. Of course I need scarcely repeat what I have so often said before, that in a disease like the above, medical aid should, if possible, be obtained.

1083. Hydrocephalus, or *Water in the Brain* (par. 362), is the disease of the brain which is most to be feared at this age, since it carries off numbers of young children every year. Its symptoms have already been detailed, and from them may be gathered that there is no little difficulty in relieving them by any remedies. It has been described as of two kinds, *acute* and *chronic*.

(*a*) *Acute hydrocephalus* requires the most active treatment to allay its first onset, or it will do irreparable mischief in a comparatively short period of time. Blood-letting, mercurial purging, and counter-irritation, by means of blisters, must all be brought to bear; and their employment must often be carried as far as the strength will admit, if life is to be preserved, so that it is needless to remark that this disease requires an unusual degree of experience, united with boldness to grapple with it. No one in their senses would willingly take the responsibility in such a case, without a full confidence in his powers from having had numerous opportunities of witnessing the progress of this disease; but, nevertheless, it does sometimes happen that such a fearful task must be undertaken, and therefore I shall endeavour to lighten it as far as possible by a clear description of what is usually necessary in such attacks, though the complications are so numerous that there are hardly ever two seen alike. Supposing, therefore, that the acute disease, as described at page 121, is established, it will generally be prudent in the first instance to lower the circulation by the loss of blood and purging, which latter also acts by counter-irritation. For this purpose, two, three, or four leeches should be applied to the temples, and a brisk mercurial purge should be immediately given, consisting of calomel and jalap in the dose proportionate to the age. After this has acted, and while there is still a feverish state of the system, the following mixture will probably be of service, by reducing the action of the heart and arteries, and acting also on the kindneys:—

Take of Nitrate of potass, ʒss to ʒj.
Tincture of digitalis, ʒj to ʒij.
Spirit of nitric ether, ʒij to ʒiij.
Tincture of squills, ʒj to ʒiss.
Camphor mixture, ℥vss.

Mix, and give one or two table-spoonfuls every four hours. It is a very common practice to give calomel in small doses frequently repeated, so as to produce slight salivation, and in comparatively strong hearty children this may be of service; but in those delicate and scrofulous constitutions which are generally attacked by this disease, the remedy, instead of diminishing the general irritation of the system, seems only to increase it. When it is given, the dose is as follows :—

Take of Calomel, gr. ss to j.
Antimonial powder, gr. j to ij.

Mix, and give twice a day in treacle or honey. Blisters to the back of the neck or to the crown of the head are of the greatest possible service. They should be kept open as long as practicable, as it is upon the free discharge from them that their utility depends, and not so much upon their power of counter-irritation. The bowels are to be kept open by giving rhubarb and magnesia or rhubarb and jalap at short intervals, and the *diet* is to be of the lightest kind, yet still such as to afford a due degree of nutrition. As soon as the first or *inflammatory stage* has disappeared, it will be proper to vary the treatment considerably. The calomel should now be withdrawn, and in its place iodide of potassium may be substituted, together with digitalis and other diuretics. The strength must be supported by more nourishing food, and the blisters should be continued without intermission, applying fresh ones as fast as the former are healed over, and choosing a new surface to act upon—if possible, on the head itself. The bowels are often obstinately costive, but they may be relieved by injections of gruel with castor-oil and turpentine or salt, together with the internal use of drastic purgatives, such as scammony and jalap, or, in some rare instances, croton-oil must be employed, but this is only as a last resource. The following prescriptions for these several purposes may be found useful :—

Take of Castor-oil, ℥ss to ʒvj.
Spirit of turpentine, ʒij to ℥ss.

Mix, and use as an enema, with half a pint of thin gruel, with which it is to be well incorporated by stirring.

Take of Iodide of potassium, gr. xl to gr. l.
Tincture of digitalis, ʒj to ʒij.
Spirit of nitric ether, ʒij to ʒiij.
Infusion of horse-radish, ℥iiiss.
Camphor mixture, ℥iv.

Mix, and give one or two table-spoonfuls every six hours. If the pulse becomes too low, the digitalis must be diminished or withdrawn; *or*, if there is great debility, the following mixture may be used :—

Take of Iodide of potassium, gr. xl to l.
Compound essence of sarsaparilla, ℥ss to ℥j.
Compound tincture of bark, ℥ss to ℥j.
Water, ℥vj to ℥vij.

Mix, and give one or two table-spoonfuls three times a day. If the convulsions, which are so general in this stage, should occur, the warm bath may be used; but it is of little service, as they depend upon mischief going on within the brain, and though warm water has a powerful effect in allaying its effects upon the limbs through the nerves, yet it does nothing towards the original mischief. Blisters or setons must be the main agents in effecting what relief can be expected; but though such cases do sometimes pull through, yet it is scarcely to be expected that they should, without the most careful superintendence of an experienced eye. Still no one should give up, even in the most disheartening state, as it does sometimes happen, that in spite of an apparently extensive disease in the brain, the constitution has power enough to throw off its effects, and the child ultimately recovers.

1084. CHRONIC HYDROCEPHALUS (par. 363), being a very different disease from the foregoing, requires a very different treatment, but it is of that nature, that it is even less likely to be benefited by unskilled superintendence. Counter-irritation to the neck and head may, however, be tried and persevered in for months together, by means of blisters, issues, or setons. The use of hydropathic measures is sometimes serviceable by means of the douche *carefully applied*, or of wet compresses, but this remedy is of so powerful a nature when applied to the head, that it requires the greatest possible caution. Mercury may be used in small doses, especially when the liver is inactive, as it generally is; and if the bowels are costive, they may be kept in order by small doses of rhubarb and ipecacuanha, or rhubarb and magnesia, every other day. Active purging, however, in this disease, will generally do harm rather than good, and is not to be thought of as a rule, though exceptions may occur here as elsewhere. Iodine applied externally by means of the tincture, or of the iodide of mercury ointment, may be used as a means of counter-irritation, in addition to its specific effect as an absorbent. For these several purposes, the following prescriptions may be employed:—

Take of Tincture of iodine, ℥j,

and brush a tea-spoonful of it over the back of the head and neck every morning. A scale of scarf-skin will form, which must be removed as soon as it is loose, in order to enable the tincture to act:—

Take of green Iodide of mercury, ʒj.
Lard, ℥j.

Mix, and rub ʒj on the head and back of the neck every night.

Take of Iodide of potassium, gr. xl to gr. l.
Compound essence of sarsaparilla, ℥ss to ℥j.
Spirit of nitric ether, ʒij to ʒiij.
Spearmint water, ℥vij.

Mix, and give one or two table-spoonfuls thrice a day. The head has in some rare cases been tapped by means of the ordinary trocar, and the operation has been followed by a complete recovery, but it is not one which could possibly be entrusted to the hands of any one but a practical surgeon.

SECT. 4.—TREATMENT OF THE CHRONIC DISEASES OF THE BLOOD, AND OF THE VESSELS WHICH CONTAIN IT.

SUB-SECT. A.—BLOOD DISEASES.

1085. PLETHORA (page 132) is not seldom met with in the child, in whom there is then a disposition to make blood far too rapidly, as evidenced by flushed cheeks, head-ache, and other symptoms detailed at par. 387. In such cases the diet must be regulated, either giving no meat at all, though this will seldom be required, or else allowing it only every other day, or twice a week, as the necessities of the case may demand. It is a state not often met with in close and confined situations; but I have more than once seen it in those rural localities, where the air is of a bracing character, and yet, where the roads are so bad as to interfere with the child's proper exercise during the winter months, as often happens in clay districts. Beyond this regulation of the food, it will seldom be necessary to do much, an occasional aperient being, perhaps, the only exception, and that being much better omitted, if only the diet is strictly regulated to the proper scale.

1086. ANŒMIA AND CHLOROSIS (page 132), being the exact opposites of plethora, will require, as might be expected, the precisely reverse treatment by means of diet, and in addition, steel and other tonic medicines will generally be required. As, however, they are to be considered as belonging rather to half-grown girls than to children, the details of the treatment will be found given in the next division of this work.

1087. SCROFULA (page 133) is more peculiarly the disease of childhood, as when it makes its appearance it is always developed at that age, although its effects may be continued in after-years. It will be desirable, therefore, to allude here to the beneficial treatment of—

(*a*) *The scrofulous constitution and tubercular deposits.*

(*b*) *Scrofulous enlargement of the external glands.*

(c) *Mesenteric disease.*

(d) *Scrofulous disease of the joints.*

(e) *Scrofulous abscesses in the cellular membrane.*

(f) *Spinal disease.*

(a) When the constitution appears to be decidedly of a scrofulous character, as shown by the appearance of the symptoms detailed at par. 393, it is especially necessary that great care should be taken to invigorate it in every possible way, so as to prevent the increase of that debility which is one of the chief characteristics of the disease. For this purpose, the *diet* should be of the most nutritious kind, taking care that it agrees with the stomach. Poultry, game, fish, and butcher's meat may all be allowed in turn, together with a fair proportion of wholesome vegetables and fruit, such as mealy potatoes, cauliflowers or brocoli, well-boiled cabbages, and even occasionally peas and beans, provided the stomach is not particularly squeamish and inclined to be upset on slight provocation. With regard to fruit, a small quantity of the most wholesome kinds will be beneficial rather than otherwise, such as strawberries, raspberries, ripe apples, especially if baked, or pears. Wine or home-brewed malt-liquor will often be of great service when the circulation is not inclined to be irritable, but if so, it must not be used. Next to diet comes *exercise in the open air*, which should be continued as far and as long as is consistent with the bodily strength. If this is at a low ebb, it may be taken in a carriage, or on a horse or donkey, which last kind is often very beneficial. *Sea air* is a well-known curative and preventive agent in scrofula; but it only seems to act upon those who are submitted to it *as a change*, for the residents at the sea-side are not more exempt from this disease than are those similarly situated in all other respects who dwell inland. But as a change it is invaluable, and does in most cases far more towards a cure than all other remedies put together. *Sea-bathing* also aids greatly, especially if the child has been gradually prepared for the use of cold water by the hydropathic process known as "wet friction" (see page 204), or by the use of cold water in the ordinary way. If this has not been done, it will be scarcely safe to commence *cold* sea-bathing directly after reaching the sea-side, and the better plan is to inure the child gradually, by the adoption of the tepid salt-bath, gradually lowering the temperature until it is little above that of the sea. Twice a week is quite often enough at first, but, as the strength increases, the bath may be tried every other day, and at last, especially if the weather is warm, a daily plunge will do good; but in no case should the immersion be continued for more than a few minutes, and a mere plunge will almost always be the proper extent of this kind of bathing. *The clothing* should be warm, but not so much so as to cause excessive perspiration, which is injurious both from its lowering effect, and the tendency to chill which it establishes. Flannel, or some woollen fabric, should be worn next the skin, both in winter and summer, but at the latter season it may be of the thinnest kind which is manufactured. With regard to *medicine*, it is very often unnecessary, if the child eats well, digests its food, and passes it off from the bowels properly, with a due admixture of bile. If, however, there is a failure in any of these particulars, it must be remedied by suitable medicine. Thus, if the appetite is defective, quinine, or quinine-and-iron will be of service, while, in the case of a weak digestion, some stomachic, such as gentian, or cascarilla, or valerian, will be more proper. If, moreover, the bowels do not act, rhubarb will be found to weaken less than any other aperient medicine, or sometimes castor-oil, or olive-oil in delicate children, will have the desired effect. Steel often acts as a charm, especially when combined with quinine where there is a failure of the appetite, or with valerian and ammonia when the stomach is deficient in tone, and the system in general is at a low ebb. Should the liver be inclined to be torpid, mercury must, if possible, be avoided, and ipecacuanha with rhubarb, given in its stead. The iodide of potassium is supposed to have a specific effect in this disease, especially when combined with sarsaparilla; and there can be no doubt that it has great power in reducing the enlargements of the glands, which often show themselves; but whether it acts beneficially on the system in scrofula is not so clear. If iodine is given at all it should be in the form of iodide of iron, which is generally prescribed in the shape of the syrup made with that drug. Cod-liver oil is found to do great good in scrofula, when there is considerable emaciation, with a defective appetite, and great irritability of the mucous membrane. In such case, especially if combined with steel, it will often re-establish the health in a wonderfully short time. The following prescriptions may be found useful:—

Take of Citrate of quinine and iron, gr. xl to l.
Bicarbonate of soda, ʒiij.
Tincture of cardamoms, ℥ss.
Syrup of orange-peel, ℥ss.
Water, ℥vij.

Mix, and give a table-spoonful three times a day, with a dessert-spoonful of lemon-juice, or in older children double the quantity of each;

Or, take of—
Wine of iron, ʒj to ʒij.
Compound tincture of valerian, ʒvj to ℥i.
Water, ℥vij.

Mix, and give one or two table-spoonfuls three times a day;

Or, take of—
Syrup of iodide of iron, ʒss to ʒj.
Infusion of orange-peel, ℥j.

Mix, and give as a draught two or three times a day;

Or, add to the last draught from ʒj to ʒiv of cod-liver oil;

Or, give the cod-liver oil alone, or with some infusion of cloves;

Or, take of—
Iodide of potassium, ʒss.
Compound essence of sarsaparilla, ʒvj.
Compound tincture of bark, ʒiv.
Peppermint water, ℥viss.

Mix, and give one or two table-spoonfuls three times a day, when there is a tendency to enlarged glands or joints;

Or, take of—
Infusion of gentian, ℥viss.
Infusion of rhubarb, ℥j.
Tincture of cardamoms, ℥ss.
Liquor of potass, ʒiss to ʒij.

Mix, and give one or two table-spoonfuls three times a day, when the stomach is weak and the appetite bad, with a moist but slightly furred tongue. If tubercles are developed in the lungs, but there is as yet no absolute softening attended with cough, it is better to attend to the general health, and leave them alone. Counter-irritants may be tried if there is the slightest evidence of softening going on; but it is very doubtful whether they are not likely to set them going when they are torpid, and so their use is, at all events, a measure of very doubtful efficacy. When tubercles are softening, the disease is to be treated at all ages alike, and the reader is referred for this to the next book.

(*b*) *Scrofulous enlargement of the external glands* may occur in the neck, or in the groin, or sometimes even in the armpit. The best remedy consists in the improvement of the general health, but sometimes they are far advanced before their state is discovered, and it is not always possible to prevent the formation of matter in them, which as they are in a very visible part when the neck-glands are enlarged, will often leave a very ugly scar, and particularly if allowed to burst instead of being opened artificially by means of a small incision. Hot meat-brine and strong salt-and-water make excellent local applications, having a tendency to prevent these glands from coming forward, though not to be depended on fully if they are very tender and enlarged, and especially if the skin is already red, and adherent to the glands beneath it, Poultices made of sea-weed, by boiling it for two or three hours in sea-water, are an excellent remedy, and may be applied by night, if not both at that time and during the day, which is still better. Sometimes a plaster made as follows will be the best remedy; but the worst of it is that when it is once applied it is difficult to judge of the best time for opening the abscess, if it should form :—

Take of the plaster of ammoniacum
with mercury, and
Opium plaster, equal parts.

And spread on leather of the size suited to cover the enlarged glands. This is to be kept constantly on, and gives great relief from the pain which sometimes attends upon these suppurating glands. If the matter is apparent from the sensation of fluctuation which is felt, the sooner it is let out the better, provided the neck-glands are attacked; but in the groin or armpit the above plaster may be kept on until the abscess bursts, and then the matter may be allowed to escape by just raising the lower edge of the plaster and replacing it. They will last about ten days or a fortnight, and are far the most manageable applications in such cases, being less cumbersome than poultices, and affording more relief than water-dressing. This last remedy is, however, more applicable to the neck, as it allows of a daily inspection of the progress of the suppuration, and is easily kept on by means of a handkerchief round the throat. If the abscess is opened by thrusting a small lancet into it, a small piece of lint must be passed into the opening, or it will close in twenty-four hours; but by doing this, and replacing it daily after squeezing out the matter, in the course of a short time, the abscess is healed and there is no further trouble. On the other hand, when once the skin is allowed to become so thin as to break of itself, the abscess is converted into an open ulcer of a most unhealthy character, and there is the greatest difficulty in effecting its granulation by any means; while after all the care which can be taken, there must necessarily be a puckered scar, from the loss of substance which has taken place. It is for these reasons that the artificial opening is advocated, and the earlier it is done, the less probability there is of a permanent disfigurement, because the skin is entire, and there is no actual loss of substance beneath it. The best dressing for these abscesses while discharging, or for an open scrofulous sore, is the ointment of nitric oxide of mercury spread on lint, and kept in its place by narrow strips of adhesive plaster, soap plaster not adhering sufficiently for the purpose.

(c) *Diseased Mesenteric Glands* (page 137), sometimes called *decline, or abdominal consumption*, will demand a *diet* of a much more mild and soothing kind than in any other form of scrofula. It is here that cod-liver oil is especially useful, as it offers exactly what is required and nothing more. Whenever, therefore, the stomach will bear this remedy, it should be administered in as full doses as it can be borne. It will generally be found to act gently on the bowels, so as to supersede the necessity for aperients, which are otherwise almost always required; though, on the contrary, there is sometimes diarrhœa, which must then be checked by chalk, and even sometimes by opium in addition. Together with the oil, a light farinaceous kind of diet must be persisted in, and on no account should solid animal food be allowed, as its presence in the stomach only irritates the mucous membrane, and its absorption through the glands increases their tendency to enlargement and congestion. If the liver refuses to act, small doses of mercury-with-chalk must be given; but, if possible, the stomach should be kept clear of medicine, always excepting the cod-liver oil, which acts more as an aliment than as a mere drug. Counter-irritation by iodine, in the form of the tincture or the iodide of mercury, will afford relief, partly by its derivative powers, and partly by means of the absorption of the drug into the blood. The use of the hydropathic compress (par. 682 *a*) is said to be of great service in this disease; but as I have never seen it tried, I cannot speak from personal experience, though I have certainly seen one case in which great benefit had been derived from the treatment by this process some time previously to its coming under my observation.

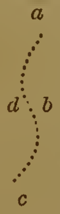
(*d*) *Scrofulous disease of the joints* (see page 138) must be treated partly on the general principles alluded to at (*a*), and partly by local means, which consist chiefly in counter-irritation and the application of remedies, which act specifically by producing absorption. The most common of all is disease of the *hip-joint*, which is also the most unmanageable, and particularly by domestic treatment, as there is always a great obscurity in the symptoms, while the question constantly arises, whether local depletion by leeches will do more harm constitutionally than it will do good locally, by lowering the inflammation of the joint. At first it is mostly prudent to use leeches once or twice; but unless the pain is great, together with high fever and other symptoms which encourage the abstraction of blood, it is seldom prudent to persevere with their employment. Blisters and issues are far more permanently beneficial, and as they only remove the serum of the blood without its red globules, which are already too scanty in scrofula, they may be considered to be unobjectionable in every way. The tincture of iodine, applied with the brush all over the outside of the hip-joint, is very useful when the first inflammation has subsided, and the case assumes a chronic appearance; but the great point is to keep up the plan of counter-irritation for months together, without intermission, so as to tire out the disease, and prevent the chance of its return, which it is very apt to do on the slightest provocation. The joint should be rested as far as is practicable, which compels the adoption of the couch, and prevents all exercise, whether active or passive, unless a recumbent carriage can be so arranged as to allow of this kind of exercise without the slightest risk of injury. Next to the hip-joint in importance come the *knee and the ankle*, both of which may, however, be treated without absolutely resting the whole body, by means of various mechanical appliances, which will prevent motion in these joints. As in the hip, so also here, the first thing to be done is to allay inflammation, which sometimes requires leeches, but these may often be dispensed with, and blisters or iodine may at once be applied. Issues create rather too great a drain upon the system to be borne in decided scrofula, so that they are somewhat objectionable in these diseases of the joints, and the preference must be given to blisters, and especially to the counter-irritation by iodine. The biniodide of mercury, made into an ointment in the proportion of ʒj to ℥j or ℥jss of lard, will often serve the double purpose of counter-irrritation and absorption by the specific powers of the two remedies combined in it. It gives considerable pain, especially if any part of the thin skin at the bends of the joints is touched by it. The best plan is to smear it on lightly, and then cover it over with carded cotton, oil-silk, and a bandage, or sometimes pressure by means of soap-plaster equally applied over the whole joint will serve the double purpose of keeping it at rest and affording support and pressure at the same time. But this requires considerable tact and skill, or more harm than good will be done. If matter forms about the joints, the sooner it is let out the better, as otherwise it is apt to burrow among the tendons and muscles, and thus form long sinuses, which are afterwards most difficult to heal. Mercury and camphor, united together in an ointment, form a very celebrated remedy in indolent scrofulous swellings of the joints, and was much used by the well-known surgeon, Mr. John Scott, by whose name it is now known as "Scott's ointment;" but it is not, I think, equal in its effects to that mentioned above. The proportions are as follows:—

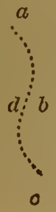
Take of Soap cerate,
Strong mercurial ointment, ā ℥j.
Powdered camphor, ʒj.

Mix. This is spread on lint and adapted to the joint; after which soap-plaster is put on evenly, and over that mill-board splints softened with hot water, and kept in their place by a bandage.

(*e*) *Scrofulous Abscesses* in the cellular membrane may occur in any part of the body (see page 138). Their progress is so slow as often to lead to the belief by inexperienced persons that they do not contain matter at all, but on opening them this error will be discovered. If allowed to burst, they attain an enormous size, and therefore it is advisable to empty them artificially as soon as it is safe to do so. It is very important to exclude the air from them, and for this reason the plan is adopted of drawing the skin on one side before the lancet is inserted, so that the opening in the skin does not coincide with that in the walls of the abscess when the hand is removed, after squeezing out the contents of the abscess. The only objection to this method is, that it requires a repetition of the incision, as the matter cannot be withdrawn daily, inasmuch as the opening heals at once, but it is a less evil than that produced by the admission of air, and is found to be the proper way of treating these indolent collections of matter. In this way, what are called *psoas* and *lumbar* abscesses (page 139) are always opened, and, in fact, all large abscesses of a scrofulous nature. They must not be suffered to fill again as completely as before, but each time of opening them they should be less full than at first, so that at last it may be hoped they will disappear, or if very small, they may be treated in the ordinary way.

(*f*) *Spinal disease* of a scrofulous character, which it generally is, can scarcely be considered within the scope of domestic treatment, inasmuch as it almost always demands a certain amount of mechanical contrivance. In the early stages, however, much may be done to obviate further mischief, and remove that which has already been done, by means of friction by the hand, and partial rest during certain hours of the day. *In curvature from rickets* (par. 407), constitutional treatment will be the only means practicable by the mother; though here instrumental assistance may sometimes go hand-in-hand with strengthening measures, and will effect great improvement in the condition of the spine. Air and carriage-exercise are all-important in bracing the body, and therefore the child must be allowed to go abroad, so that the mechanical means to be adopted must be such as to allow of its doing so. Here, however, there is the misfortune that *all the bones* of the body are soft and yielding, so that it is not safe to make pressure upon any, in order to rectify curvatures of the spine. Hence, the only plan left is to arrange a portable couch upon which the child may be laid, and perhaps some slight means may be adopted of extending the spine, by means of pulleys attached to the limbs, but this must all be left to the skill of the mechanist, who alone can be expected to accomplish the task. *When curvature arises from weakness of the muscles* (par. 408), friction affords a most valuable remedy, and should be diligently practised from the first moment that the alteration from the straight line has been discovered. It has been mentioned at page 139 that, in all lateral curvatures, there are two bends or curves, and these must be carefully studied in order to understand the method of rubbing. For instance, we will suppose that the curve is as represented by the following diagram, in which the left shoulder would be prominent, and the left hip higher than the right. Here the friction should be employed along the muscles lying by the side of the spine, from *a* to *d* and *b* to *c*,—that is to say, on the outside of the curves of the spine, and not along their inside edges. Consequently, from *a* to *b* and from *d* to *c* must be omitted from the friction. But should the curve be the reverse, as shown in the next diagram, namely, when the right shoulder is prominent, and





the right hip raised, then the friction will be employed from *a* to *b*, and from *d* to *c*; while the two masses of muscle from *a* to *d*, and from *b* to *c* will be left out of the rubbing, inasmuch as they are already too much contracted, and do not, therefore, require the stimulation which friction affords, but rather relaxation. The hand should be pressed well into the muscles, and not merely applied to the skin, so that they should be stimulated by pressure as well as by the extra circulation produced in the skin itself. This friction is to be kept up for at least a quarter of an hour at a time, and must also be repeated two or three times a day at regular periods, after which the body should be laid at full-length on the back upon a rug or firm mattrass, without pillow or other support to the head. If the mattrass is used, it should be placed on the ground, or on a *lath-bed*, and not upon sacking, which yields too much, and allows of a curve in the body, which is especially to be avoided. This recumbent position must be maintained for an hour, or in slight cases half that time will do, after which walking exercise may be allowed; but there should be no more sitting than is absolutely required for the purpose of carrying on indispensable scholastic duties, such as writing or music, &c., and even these must be sacrificed in bad cases. By a continuance in this plan of treatment for some months, most curvatures assume their natural straight line, but sometimes they are not discovered until the arch is so great as to defy the powers of the muscles alone to rectify it, and then some mechanical means must be adopted, consisting either in pulleys fixed to a couch, or in steel crutches, which lift the shoulders beneath the armpits, while they are supported from below by means of pressure made upon the hips; at the same time the chest is laced within a corselet of padded and stiffened material, which assists in rectifying the derangement of shape, and, in the course of some months, the most crooked spine may be made straight, though still there is considerable difficulty in keeping it so, since the pressure upon the muscles, and the rest which they obtain, tend to weaken their powers, and to prevent their acting, rather than to brace them into increased tone, which is the real object of all curative agents. Still, in very bad cases, there is no help but this and the attempt must be made; while, at the same time, the general health of the body must be improved, so as to lead to the hope that when the crutch is removed, the gain in general strength may have been so great as to counteract the loss by the local treatment. After the removal of the instrument, friction is of the greatest use, and should be applied on the same principles as is advised above, guided by the curvature, if any slight vestige of it remains, or by a knowledge of its former existence, if altogether gone. Kinesipathy and gymnastic exercises may be made also to serve the purposes of bracing and strengthening the spine, as observed under the chapter devoted to the former, at page 213; but I much doubt, whether they can be made to serve as a means of cure, at all events not without a very deep knowledge of muscular anatomy, as there is great fear of strengthening the contracted muscles instead of those which are relaxed. *In absolute caries* of the spine (par. 409), our only hope is to obtain anchylosis or bony union, and we have no chance of procuring this without an angle, so that the body must be left to take its own curve. Absolute rest in the recumbent position is the sole agent which is to be relied on, together with such general and bracing remedies as can be adopted in that position. It is, of course, doubly important to procure fresh country air, since exercise cannot be taken in any shape. Issues are generally applied; but it is very doubtful whether they do not produce more harm by their lowering effect upon the general health, than they do good locally by counter-irritation. Nature must here be left to her own resources, only taking care to place the patient in the most favourable circumstances, in reference to air, diet, and amusing occupation for the mind.

SUB-SECT. B.—THE TREATMENT OF CHRONIC DISEASES OF THE BLOOD VESSELS.

1088. THE ONLY DISEASE of this division of the body which is at all peculiar to childhood is the *nævus* or *aneurism by anastomosis*, which so often is developed into activity at this age. This, however, has been already treated of at page 278. True aneurisms, varicose veins, piles, &c., are not often met with until after puberty.

1089. HEMORRHAGE, in its various forms, is also an accident, which is common to all periods of life, and will be better discussed in the next book.

SECT. 5.—TREATMENT OF THE NERVOUS DISEASES OF CHILDHOOD.

1090. EPILEPSY (see page 147), though almost always commencing in childhood, is not confined to it; and its treatment will, therefore, fall under the next book.

1091. CHOREA (page 150), on the other hand, is peculiarly a disease of childhood, being almost confined to the age between five and fifteen. It is highly necessary in this disease to discover the cause, which is very commonly found to consist in the presence of worms in the intestines, the removal of which by the appropriate remedies will generally suffice, without any further treatment. If, however, they do not exist, (or after their removal if they do), the general health must be attended to, by endeavouring to amend any symptoms of disorder in the functions, such as dyspepsia, or diarrhœa, or spinal irritation. But beyond these remedial measures, there seems to be some almost specific power in certain tonics of counteracting chorea, and especially in the salts of zinc. The treatment will, therefore, consist in attending to the condition of the digestive organs in the first instance, and then, if the disease persists, after they are set right, in giving one or other of the following remedies which are given in the order in which they are likely to be found useful. At the same time cold bathing, and more especially in the sea, will add to the strength of the system, and will, in many cases, be found almost sufficient by itself. Hydropathy here also claims to be of great service, and I believe is really beneficial in many cases.

Take of Wine of iron, ʒij.
Compound tincture of valerian, ʒvj.
Infusion of valerian, ℥vij.

Mix, and give one or two table-spoonfuls three times a day;

Or, take of—
Sulphate of zinc, gr. j to gr. iss.
Infusion of valerian, ℥j.

Mix, and give two or three times a day;
Or, take of—
Citrate of quinine and iron, gr. xl.
Compound tincture of cardamoms, ʒvj.
Water, ℥vij.

Mix, and give one or two table-spoonfuls three times a day;
Or, take of—
Syrup of iodide of iron, ʒj.
Water, ℥j.

Mix, and give three times a day.

SECT. 6.—CHRONIC DISORDERS OF THE DIGESTIVE ORGANS.

1092. THE DISORDERS OF THE DIGESTIVE ORGANS in childhood are almost always dependent upon errors of diet, and their treatment must be conducted with that knowledge, upon the principle of its amendment, as the only legitimate means which will serve our purpose. In after life, a change of diet alone will not always suffice, because the stomach has been so long habituated to abuse that it will not recover itself without extraordinary measures; but in childhood the error cannot have been of very long duration, and, as a rule, it may be maintained that all kinds of indigestion at this age, merely require to get rid of the immediate cause of offence by a brisk aperient, and then a change of diet to a kind suitable to the state of the child will almost invariably suffice. It is true that there are some exceptions, as, for instance, when a weak and feeble constitution has long been made worse by the use of all kinds of stimulating and rich food. Here the stomach becomes so irritable that ordinary plain food will be rejected, and the child might perhaps sink from exhaustion, if compelled to live upon a plain wholesome fare. In such a case, a stomachic medicine may perhaps be needed, and at the same time a glass of wine or malt liquor will be useful; but when the stomach has been much abused, these last will often disagree. On the whole, however, the same rules will apply here as in after life, and they need not, therefore, be repeated.

SECT. 7.—TREATMENT OF WORMS.

1093. At page 157, the varieties of worms inhabiting the intestines are shown to be four, viz.:—

(*a*) The round-worm (*ascaris lumbricoides*, or *lumbricus teres*) inhabiting the small intestines and stomach.

(*b*) The short thread-worm (*ascaris vermicularis*) inhabiting the rectum.

(*c*) The long thread-worm (*trichocephalus dispar*), confined chiefly to the cœcum.

(*d*) The tape-worms (*tœnia solium* and *bothriocephalus latus*), found in the whole length of the intestines, but more especially in the ileum.

These worms are all found both in the child and in the adult; but as they occur ten times more frequently in the former than in the latter, they may fairly be considered here. It must be remembered that in all cases of worms two things are to be done—viz., 1st, to expel them; and, 2nd, to give tone to the mucous membrane, so as to prevent their reproduction, for it appears quite clear that they only can live where there is a want of this healthy condition.

(*a*) *The Round-worm* is expelled more easily than either of the other kinds. Calomel and scammony form the most usual remedy in this country, or calomel and jalap; but the result is not always so satisfactory as might be desired, and these worms sometimes bid defiance to both. Couhage (*dolichos pruriens*) is very useful, inasmuch as it is perfectly harmless to the child; but it has also in some instances been found to be equally innocent of power in annoying the worms. The Indian or Carolina pink is a most powerful remedy for this kind of worm, and will seldom fail to expel them; but it is sometimes apt to cause colicky pains, and even inflammation of the intestines, though such an occurrence is, I believe, very rare. Still, however seldom it may occur, it ought to be known and guarded against, so that it would not be prudent to give it to a delicate child. Powdered glass and tin are also popular remedies of some efficacy, but they are not fully to be depended on. The areca or betel-nut has lately been used for the purpose of expelling these worms, and with the best results, but the cases in which I have known it used are too few to warrant its general recommendation. The following are the best formulas for medicines to remove the round-worm:—

Take of Calomel, gr. ij to iij.
Powdered jalap, or compound powder of scammony, gr. vj to gr. x.

Mix, and give in the morning fasting, following it up by plenty of warm gruel at the expiration of about two hours.

Or, take of—
Indian pink, ℥ss.
Boiling water, Oj.

Macerate for one hour, then strain, and give from a table-spoonful (which is the dose for a young child) to three or four ounces (which is that proper to a child of nine years of age). It should be given fasting, and at the expiration of an hour a dose of castor-oil should be administered. The Indian pink should never be used less than three or four times, at intervals of four days between them. *Great care should be exercised in obtaining the drug*, as I believe it is often the practice to substitute some other plant for it.

Or, take of—
Powdered tin, ℥ss.
Treacle, enough to form a thick mass,

which is to be swallowed in the morning on an empty stomach, and to be followed at the end of an hour or two by a dose of castor-oil, and the free use of gruel.

(*b*) *Thread-worms* seldom require any internal medicine, since they may readily be reached by injections *per anum.* For this purpose, turpentine mixed with oil forms the best kind of liquid, and it is to be thrown up with a syringe, which will contain four oz. at least. This quantity is sufficient for a young child, but for one ten years old, double the quantity may be thrown up. The following is the formula:—

Take of Spirit of turpentine, ℥ss.
Olive or linseed oil, ℥iiiss.

Mix, and inject; keeping it up as long as the bowel will bear it, by making pressure with a warm cloth. If the injection does not seem to reach high enough, an aperient of calomel and scammony must be given, as ordered under (*a*).

(*c*) *The Long Thread-worm* is dislodged by calomel and jalap, or calomel and scammony, as ordered under (*a*), for the round-worm. It is, however, a kind of worm which appears to give very little annoyance; and it is very difficult to ascertain its presence by any symptoms during life, and consequently equally a matter of doubt whether remedies used for its expulsion are successful or not. Turpentine given internally most probably would remove it, but there is great doubt whether this remedy is not worse than the disease.

(*d*) *For Tape-worm* several remedies are adopted, all of which appear to be vaunted by their advocates as perfect specifics, and yet all fail in certain cases, without the slightest doubt. Turpentine may, perhaps, be considered to be the most active against the worm, but it also upsets the patient most terribly, when given in such a dose as to be really efficacious. Kousso, on the other hand, though occasioning a certain amount of sickness and discomfort is not very disagreeable in its effects upon the human stomach, but then it often fails in expelling the worm; and, lastly, the oil of male fern appears to act energetically upon the worm, and is not very injurious to the stomach of man. Beyond these few remedies, there is no drug worthy of trial, as far as I know, though the pomegranate bark is considered to be so by some of those who have used it. My own experience, however, assures me that it is not of much service, and certainly not nearly so useful as the kousso, which is much more unobjectionable, and, if more efficacious, is certainly on that account to be preferred. The following are the several modes of using these remedies—taking care always to repeat them at intervals of a fortnight:—

Take of Powdered kousso, ʒij to ʒiv.
Boiling water, ℥viij to ℥xij.

As soon as cool enough add the juice of half a lemon, and after stirring all up, swallow the infusion, with the powder suspended in it. It is to be taken in the morning, after fasting at least twelve hours, and it should be followed up by a dose of castor-oil at the end of three or four hours;

Or, take of—
Spirit of turpentine, ʒij to ʒiv.
Castor-oil, ʒiij to ℥ss.
Peppermint water, ℥j.

Mix and shake well up together, and swallow. If this does not act fully on the bowels in two or three hours, give a full dose of castor-oil, and plenty of thin gruel;

Or, take of the oil of male fern, min. xx to xxx.

Drop the quantity on a lump or two of sugar, and give at once. It should be followed by oil if it does not purge freely; gruel to work it off will be required. It does not act so well on the *tænia solium*, as on the *bothriocephalus latus.*

1092. Having expelled the worms from the intestines, it is next prudent to strengthen the stomach so as to prevent their return. For this purpose nothing answers so well as steel, in combination with a bitter, or with valerian, which in itself is prejudicial to worms. The following may, therefore, be tried:—

Take of Wine of iron, ʒij.
Infusion of valerian, ʒvij.
Tincture of calumba, ʒvj.

Mix, and give one or two table-spoonfuls twice a day.

1094. HYDATIDS, and the other worms enumerated at page 159, are so rarely met with, and so difficult of detection during life, that it is quite useless to say anything about their removal.

SECT. 8.—DISEASES AND ACCIDENTS OF THE EYE, EAR, MOUTH, &c., INCIDENTAL TO CHILDREN.

SUB-SECT. A.—DISEASES OF THE EYE.

1095. THE STYE is generally better left alone, though when very large and painful, a fomentation, with hot water, will afford some relief.

1096. STRUMOUS OPHTHALMIA (page 162) may generally be relieved and cured by attention to the health of the child without any local application; and this last should seldom be thought of by any but an experienced oculist. But constitutional treatment may be attempted by a mother, if she is only satisfied of the true nature of the disease, with a fair degree of probability that success will attend upon her efforts. The first thing to be done is to see that the secretions are in good order; and if the liver or kidneys are deficient in action, the appropriate remedies must be used (see page 318). When this is attended to, and it is found that there is no want of bile and of a healthy secretion of urine, a tonic treatment must be adopted, joining with it some sedative, such as conium, which seems to have almost a specific effect in this disease, or digitalis if the heart is inclined to be irritable. Sometimes quinine, and at others the iodide of potassium, seems to exert the most curative power; but I have generally found that in true strumous ophthalmia the union of quinine and conium is the specific curative agent. If this combination does not agree, then the iodide of potassium, with sarsaparilla and small doses of digitalis, will, most probably, have the desired effect. When the *pustules*, mentioned at par. 501, make their appearance, it is sometimes necessary to apply a caustic; but I should scarcely advise its being used without professional advice, as it may possibly do great harm. Nevertheless, in urgent cases occurring at a distance from surgical aid, it may be better to run this risk than allow of the mischief extending, which it will sometimes do, if left to itself. The following remedies are, therefore, enumerated, with the above caution, as to their application in practice:—

Take of Sulphate of quinine, gr. viij.
Extract of conium, gr. xxiv.

Mix, and divide into eight pills, one of which is to be given three times a day;

Or, to a child under four or five years of age, half a pill may be chopped up and given in jam or honey;

Or, take of—
Iodide of potassium, gr. xl.
Spirit of nitric ether, ʒiss.
Compound essence of sarsaparilla, ʒvj.
Tincture of digitalis, ʒj to ʒiss.
Mint water, ℥vij.

Mix, and give one or two table-spoonfuls three times a day. If the heart is beating quietly with a slow pulse, the digitalis is better omitted.

Take of Nitrate of silver, gr. x.
Solution of acetate of lead, minims xv.
Lard, ℥j.

Powder the nitrate *very minutely* in a glass mortar, then add the solution, and mix carefully with the lard. A small piece of the size of a grain of wheat to be inserted between the lids with a probe or silver bodkin every other day.

1097. SQUINTING, formerly so common among children, is now so easily cured by operation, that its presence is comparatively rare. Nevertheless, the operation requires considerable skill and practice; and as it can never be required at short notice, there is no excuse for its performance by any but the practical surgeon, who should be consulted as to the proper time for its adoption, &c.

1098. Where a child is short-sighted, it should never be supplied with glasses, unless the defect is so great as to occasion danger or great difficulty in performing its ordinary tasks, and taking exercise out of doors. It is found that by the use of concave glasses, though the cornea does not become more convex, yet the sight certainly gets worse, because the accommodating power in the eye is not called into play. On the other hand, if the child is compelled to use its eyes at the greatest focal distance at which it can make objects out, this accommodating power is educated to a great extent, and the sight becomes gradually improved. It is somewhat difficult to do this with a young child, especially in prosecuting tasks which are generally of themselves unpleasant to it; but at a more mature age, when the child can be reasoned with, and shewn the importance of the object in view, it may be persuaded to take the necessary pains, and thus to obviate the necessity for a great inconvenience, which glasses certainly are, even at the best. That they are a great boon to the short-sighted, no one can deny; but, at the same time, no one who has worn them would do so if he could avoid it, and most people would gladly go through any ordinary course of treatment to get rid of the incumbrance. All that is needed for this purpose is to strain the eyes to their utmost as to focal distance for a given period during each day, and it will be found that about one hour twice in the day will be sufficient for the purpose. Thus, in reading or drawing, or any other similar occupation, the book or paper should be placed on a desk, and an open sliding frame to fit the face should be so arranged above and in front, that the face will be prevented from approaching nearer the board than a certain limit, which can be fixed and adjusted by the slide. The child's head being placed on the frame, the slide is raised slowly till the eye is unable to make out the letters, and then being returned to the point where it is barely possible to do so, it is fixed there, and the hour is passed in reading or drawing at this distance. It is soon found that the letters which at first were almost invisible become gradually quite clear to the eye, and at the end of the hour the focal distance is quite near enough for reading or drawing comfortably. It is seldom desirable to hasten the process too rapidly, and this distance should be maintained for some days, the eye by that time being fully accustomed to its work; but after three or four days the frame may be raised a quarter of an inch, and as soon as this increase is surmounted by the eye, or, if possible, in three or four days more, another quarter of an inch may be gained, proceeding in this slow and cautious way until no further progress can be made. It will be found comparatively easy in most cases to increase the focal distance for comfortable reading three, four, or five inches, but beyond this there is considerable difficulty; nevertheless, double the above distance will, by perseverance, be managed, although the intervals necessary between the shiftings of the frame may be months instead of days. It must be remembered, that when the focal distance for reading is increased a quarter of an inch, that for the common purpose of life is augmented by yards, or perhaps in a still greater proportion; so that, both for out-door purposes as well as in-doors, there is great encouragement to make the effort; and if carefully carried out, with a full co-operation on the part of the child, it is almost always attended by a share of success which in after-life is estimated at a high value.

SUB-SECT. B.—DISEASES OF THE EAR.

1099. A SCROFULOUS DISCHARGE FROM THE EAR is described at page 164 as very common among delicate children, and for this the same treatment is appropriate as has been described in the last sub-section for strumous ophthalmia. Great cleanliness must be adopted in reference to the discharge, which is apt to inflame the skin of the neck, if allowed to accumulate and run down over its skin. Counter-irritation will sometimes do good, by applying a small blister behind the ear; but the discharge should not be encouraged to any great extent, or the drain on the system will do harm. A wash of the solution of chlorinated soda may be useful, but it must not be injected into the ear with any force; a piece of sponge being the proper vehicle for its insertion into the passage by squeezing it gently. The wash is as follows:—

Take of Solution of chlorinated soda, ʒij.
Rose water, ℥vj.

Mix, and make a wash for the ear.

1100. If the ear-ache is decidedly of a nervous character (par. 519), a piece of tobacco may be soaked in warm water for a few minutes, and then rolled into a mass and inserted into the ear, or a few drops of laudanum may be inserted on a piece of cotton. Chloroform is too stimulating an application to be employed for the purpose. Laurel leaves scalded and pounded in a mortar will often give relief if applied as a poultice to the whole ear, part being pushed well into the passage.

1101. Should a Bead, Pea, or other foreign body be passed into the passage to the ear by the child, great care must be exercised in its withdrawal. It generally happens that it is large enough to fill the whole canal, so that it is very difficult to pass an ear-pick or other instrument by the side of it, and the consequence is, that it is pushed further and further into the passage until it lies closely against the drum, in which it soon establishes severe inflammation and pain. The skilful surgeon will probably be able to effect its removal by the use of forceps, but the prudent mother will avoid making the attempt when she knows that, even in the hands of an educated surgeon, the drum has been destroyed, and the small bones of the ear have been brought away instead of the foreign body, which has been pushed into their proper place. Warm water and an ear-syringe constitute the only means which should be attempted, and by their aid, if employed in a proper manner, and persevered in for a sufficient time, the object will generally be attained. The pipe used should be small, and care should be taken to allow of the free escape of the water by its side, the mistake being often made of occupying nearly the whole canal with a large pipe, and thus the force is exerted upon the pea in the wrong direction, and it is driven inwards instead of being brought out by a free back-current of the water. Before making any attempt to remove the foreign body, it should be clearly ascertained that one is present, as it is quite impossible to depend upon a child's account of its being there. It must be remembered, however, that the eye cannot reach to the bottom of the passage unless the curve in it is removed, which can be done almost entirely by taking hold of the ear and drawing it upwards and backwards, when the drum may be seen at the bottom, and about an inch from the surface, if nothing intervenes. If it is found impracticable to remove the pea by water, and no surgical aid is at hand, it is far better to allow it to remain in the ear, than to attempt any other mode of getting it out. In a few days it will most probably cause an enlargement of the passage, and will be coated with a thin wax, which will facilitate its extraction, and also defend the drum from any injury which it may occasion. Another attempt may then be made with water and the syringe, and, in process of time, by perseverance it is almost sure to be effectual. A piece of slate-pencil is the most angular substance likely to be introduced, and at the same time the most difficult to remove, as well as the most likely to injure the ear; it should therefore be suffered to remain without disturbance for a few days, if it cannot easily be removed by the water at once.

Sub-Sect. C.—Diseases of the Nose.

1102. Bleeding from the Nose occurs so frequently among children, that it can scarcely be called a disease, unless it assumes a more than usually formidable aspect, and the amount of blood lost is dangerous to life. If the bleeding merely arises from an over-abundance of blood in the body, no interference is necessary, beyond the application of cold water to the face, or a piece of cold metal to the back, while the body of the child is supported erect. If, however, the bleeding appears to be from some other cause, such as internal congestion, or the peculiarity called a hemorrhagic diathesis (see page 145), it will be necessary to resort to more powerful remedies. These consist of three kinds—1st, the *application of cold;* 2nd, that of *styptics;* and 3rd, the *mechanical plugging of the nostrils*, by which the flow is absolutely stopped.

(*a*) Cold water may be used freely by pouring it over the head and face from a watering pot, or by dashing it in the face from a basin. Nothing has more power *for a time* than a stream of cold water poured down the back; but, for this purpose, the child must be stripped and placed in a tub; and, unfortunately, the subsequent reaction is so great as often to bring on the bleeding again as badly as ever. But the use of cold water to the head and face may be maintained for some hours, and, indeed, on every fresh outbreak, so that by persevering with it the bleeding may generally be controlled.

(*b*) Alum dissolved in water, and drawn or "sniffed" up into the nostrils from the palm of the hand, stops bleeding from the nose; *or*, the leaves of matico may be dried and used as snuff, or they may be steeped in boiling water, and the infusion used like the alum water, mentioned above.

(*c*) Plugging the nostrils is performed by passing an elastic tube, containing a string in it, through the nostril down into the throat, when the string is laid hold of by a pair of forceps and brought into the mouth, while the tube is withdrawn, leaving the string with one end hanging out of the mouth, and the other from the nostril. To that in the mouth a small pad of lint is tied, and then it is drawn through the mouth against the back of the cavity of the nose, where it is held by a plug of the same material, which is pushed firmly into the nostril from before, and to which the string is made fast. If the bleeding is from both nostrils, this operation must be repeated a second time, but very often one will suffice. After a few days, when the irritation of the blood and of the plugs causes a discharge of offensive matter, the whole may be removed, and the bleeding very seldom returns; but the operation is not a very easy matter, and should not be attempted by the amateur, excepting in urgent cases at a distance from surgical aid.

1103. BEANS, PEAS, and other foreign bodies, when they are pushed into the nostrils by the child, may be removed with much more facility and with less danger than in the ear, by the use of a scoop of any kind, such as that used for marrow at the dinner-table, if at hand, or any similar instrument. If firmly impacted in the nose, they may generally be forced backwards into the throat, when they are either swallowed, or are brought out through the mouth.

1104. THE ORDINARY DISCHARGE from the nose of the child, called "a cold in the head," is better left to nature to effect a cure, which will almost always occur sooner or later.

SUB-SECT. D.—DISEASES OF THE MOUTH.

1105. HARE-LIP has already been alluded to at page 278, as requiring surgical aid. RANULA also (par. 529), which is chiefly confined to this period of life, occurs in a part which requires some knowledge of anatomy, in order to guard against injury of the vessels. The treatment of it is very simple in theory, consisting in the passing of a thread through it in the form of a seton; but, in practice, this is not so easy, as the instant the thin walls are pricked, the saliva escapes, and the whole swelling subsides.

1106. CANCRUM ORIS (page 165) is a disease of debility which occurs chiefly among children in towns, who are brought up under the disadvantages of a confined situation and bad food. The *treatment* in such cases must be partly constitutional, with a view of correcting the debility or the disordered condition of the secretions; and partly local, intended to cause the sloughing to stop by stimulating the vessels to a healthy action. Sulphate of copper (*blue-stone*) may safely be tried as a local application, rubbing it freely into the edge of the sore, but not allowing it to extend far beyond. Lunar caustic may also be used, with some little risk only of going too far and acting on the sound structures beyond what is necessary; but it is certainly not advisable to adopt either of these remedies, if it is possible to obtain surgical assistance. The constitutional treatment consists in the use of bark, or steel and valerian, as follows:—

Take of Decoction of bark, ℥xj.
Compound tincture of bark, ℥j.

Mix, and give two table-spoonfuls three times a day;

Or, take of—
Wine of iron, ʒij.
Compound tincture of valerian, ʒvj.
Mint water, ℥vij.

Mix, and give one or two table-spoonfuls three times a day.

1106*. Thrush (*aphtha*) is an eruption of small white specks which appear on the inside of the mouth, and especially on the tongue. They soon loosen in the centre, and discharge a thick mucus. Sometimes there are large patches of a loose ragged membrane, which are gray, or a dull white, or even reddish in colour. Very often the disease extends down the throat, and there is pain in swallowing, with difficulty of breathing. As the patches fall off, the mucous membrane shews itself of a bright red colour, and looks raw and inflamed. The disease is most common in early infancy, but is occasionally met with in after-life; it is a symptom of gastric inflammation. The *treatment* consists in giving very mild aperients, such as castor-oil, or manna, or magnesia, with such *diet* as shall soothe the parts, namely arrowroot, or barley-tea, or linseed-tea. As a local application, either of the following may be tried, using them by means of a brush, or on the end of the finger:—

Take of Borax, ʒss.
Honey, ℥ss.—Mix.

Or, take of—
Chlorinated solution of soda, ʒij.
Honey, ℥ss.—Mix.

BOOK III.

THE DOMESTIC PRACTICE OF MEDICINE AND SURGERY IN THE ADULT.

CHAP. I.—ON NURSING ADULTS.

1107. **The Nursing of Adults in Sickness** requires something more than a mere attention to bodily wants, inasmuch as the patient is not at this age a mere machine; and it will be found that recovery depends almost as much upon the sustainment of hope and removal of fear from the mind, as upon the merely physical remedies, which are ordered by a person who undertakes the cure. Indeed, it may be asserted, without fear of contradiction, that almost as much depends upon the nurse as upon the medical treatment; and, unless there is some one well calculated to carry out the instructions of the medical man, it is hopeless to expect much benefit from them. Some people are nurses by nature, and require no teaching; while others scarcely ever attain even the proper mode of smoothing a pillow, or arranging the bed-clothes. Cheerfulness and alacrity, without boisterousness, are the essentials to success, especially if united to that womanly sympathy with suffering which tends so much to soften the hours of pain or sickness. Even the dress should be attended to, for invalids are very captious and inclined to find fault wherever there is an opening for criticism. The colours should be light and pleasing to the eye, avoiding on the one hand those which are sombre and mournful, and on the other those which are decidedly gaudy. Officiousness in nursing is disliked by most invalids; but in this respect there is great difficulty in hitting the happy medium, some people preferring to be left alone, and only wanting the aid of a nurse when they find the necessity for it; while others, who are, however, but a small minority, are best pleased when they are constantly being asked if they want anything.

1108. **Punctuality** in carrying out the medical directions is a great virtue in the nurse, and should be carefully instilled into her by those who engage her. The meals and medicines are always ordered to be given at stated times; and in the severer forms of disease, it is always a good plan to write down the precise time for each, so that the nurse has a table to apply to, in case of forgetting her instructions. In typhus fever, in which the convalescence is accompanied by great prostration of strength, and in which as much food as the stomach will bear must be given, this point should be carefully carried out.

1109. **In Changing Bed or Body Linen**, the nurse should take great care that they are well aired, and, indeed, almost scorched at the fire. Some tact is often required to effect the change without fatiguing the patient. In very bad cases, the body linen may be taken off and put on again without raising the body from the bed, by slipping the night-gown over the head, and taking the arms out, then rolling the whole body towards the other side of the bed, the foul linen is left behind, and may be removed. In putting it on, the night-gown is gathered up into a fold in front, and laid upon the part of the bed which the patient has just left, then rolling her back again, the back lies in the proper way upon the back of the gown, and the front may be lifted over the head; after which it is easy to put the arms in the sleeves, and to pull all smoothly down. In order to change the under sheet, a somewhat similar plan is adopted.

After folding it in half, it is laid upon the side of the bed unoccupied by the patient, the upper half is then folded over and over again close to the side, upon which the patient is turned or rolled; and, in doing this, the assistant-nurse or housemaid draws the folded part of the sheet smoothly to the other side, and thus the patient is restored to her original position. Constant changing of the linen is desirable in all diseases, but especially in fever, in which, indeed, a daily change is often unnecessary.

1110. IN GIVING THE FOOD ordered for the invalid, everything ought to be scrupulously clean, and arranged with some pretensions to elegance. The sickly stomach is easily offended, and a dirty cloth or disagreeable-looking fork or spoon would easily destroy the appetite.

1111. THE VARIOUS KINDS OF FOOD SUITED TO THE INVALID are given at some length at pages 246, 247, 248; and a list of receipts for INVALID DRINKS will be found at pages 248, 249, and 250.

1112. EVERY GOOD NURSE is fertile in expedients to relieve pain or weariness, but she takes care that as far as possible they are successful. If a bed-chair is wanted and is not at hand, a common light chair, *turned upside-down* and placed behind the back, answers very nearly as well. If the patient is very weak, a cord may be fastened to the posts of a four-post bedstead, or to a couple of hooks in the ceiling if these are not used, and by the aid of this as a fixed point, the patient is enabled to raise himself whenever he likes with much less difficulty than he would experience with the unstable support of the nurse. If it is desired to lift a heavy patient from one side of the bed to another, the nurse must get on the bed and stand above him, and will thus have a good purchase. Sometimes the four corners of the sheet being held by four stout persons standing on chairs, the helpless patient is lifted from the bed while it is shaken and made comfortable. At others, one side is shaken up while the patient is lying on the other, and afterwards that side in its turn is put straight. Indeed, the clever nurse has no end to the expedients to which she may have recourse in this department, remembering always not to exceed her province by tampering with the medical treatment.

1113. THE PROPER VENTILATION OF THE SICK-ROOM is a point of the greatest importance, varying in degree with the nature of the disease and the time of year. Sometimes the window should be left open day and night; but this is not often safe, and is only applicable in sultry weather. A draught of cold air on the person of the patient should always be avoided.

1114. THE AMOUNT OF LIGHT to be admitted may safely be left to the wishes of the patient in most cases, though there are some where this rule would not be prudent or practicable, as in fevers and other diseases where the brain is affected.

1115. THE DEGREE OF ARTIFICIAL WARMTH maintained by a fire is also greatly under the control of the patient's feelings, though these are not always the best guide. The medical man, however, will give instructions on this point. In all cases, an even temperature should be kept up.

1116. NO SUPERFLUOUS FURNITURE should be allowed in the sick room, and especially in cases of fever, where curtains and carpets are likely to hold the infection, and should, therefore, be removed as soon as the nature of the disease is made out. The bare bedstead and uncovered floor looks uncomfortable, it is true; but it must be remembered that in these cases there is generally a loss of consciousness, and consequently appearances have not the same power over the mind as in those diseases where, though the body is lowered, the mind retains its activity, and the senses are often greatly increased in activity.

1117. CHLORIDE OF LIME OR ZINC in solution destroys the smell of all discharges from the body, whether natural or diseased. A spoonful should be placed in the pan, or other vessel, appointed to receive them, and in that way all annoyance to the nose is got rid of. In cases of fever, or other infectious diseases, rags dipped in a diluted solution should be hung up about the room; the degree of dilution depending upon the strength of the article furnished, which is generally marked upon the bottle.

1118. AFTER ALL INFECTIOUS DISEASES, the bedding is generally sent to the upholsterer to be purified, which is accomplished by the aid of lime. A weak solution of chloride of lime may be sprinkled over sheets and body-linen before washing; but all foul rags, &c., had better be burnt. If the strength of the solution is more than one part of that usually sold to fifteen or twenty of water, the linen will be greatly injured in strength, but this strength will seldom do much harm. In very bad cases, the walls of the room should be washed down with a solution of chloride of lime or zinc, and then re-papered or painted.

1119. THE LENGTH OF TIME during which infection is supposed to be retained by the person, as well as by the bedding, &c., is alluded to under the head of *Contagion*, in the 3rd Part.

CHAP. II.

ON THE ART OF PRESCRIBING.

SECT. 1.—THEORETICAL PRINCIPLES.

1120. UNTIL of late years it was considered that, in prescribing remedies for disease, an extensive combination of them into one mixture or other "form," was much more likely to effect the purpose, than a simple exhibition of one or two drugs. It was said that the chance of relief was greater in proportion to the number of materials grouped together, because "if one did not hit, another would;" but in this idea a circumstance of great importance was forgotten, namely, that a medicine, when it "misses," may always be considered to do something more, and is not to be calculated as a nonentity, for, unless inert, it will either do good or harm; and as no good is supposed in the case of a "miss," the harm done by the numberless ingredients in the old prescriptions, most of which might be reckoned on as failing in their object, must have been enough to operate seriously on the bodies of the patients for whom they were prescribed. It is true that a vast number of the articles which were included in such lengthened prescriptions as have come down to us, bearing the names of "mithridate," &c., are wholly inert, and therefore the injury was not so serious as at first sight might be supposed; but still the principle was bad in every sense of the word, for it was impossible to discover among so many drugs, which had been the efficacious or injurious ingredient; and therefore all improvement was prevented, and the prescription must be taken *as a whole*, and rejected or accepted, in the same way as is too often the case in modern days with many famous receipts.

1121. THE TRUE PRINCIPLE OF PRESCRIBING as few drugs as possible in combination, is, however, now so well known and recognised in this country, that it is scarcely necessary to allude to the opposite and old-fashioned method. But it is still believed on the firm basis of experimental observation, that two or three medicines must often be combined in order to produce the effect which is desired. Thus, if it is wished to cause a copious perspiration, three drugs are often combined in the form known as Dover's powder (or the compound powder of ipecacuanha), neither of which would by themselves have that effect, and, indeed, on the contrary, the opium alone would in most cases act quite in the opposite manner.

But independently of this well-known example of the propriety of combination to produce one effect, there are also many diseases in which several different symptoms must be attended to and relieved by remedies adapted to each. I have shown in the second book of the first part of this volume, that each disease is made up of various symptoms, by which it is recognised; and, therefore, in order to meet these symptoms by their appropriate remedies, we must often have recourse to almost as many of the latter as of the former. Thus, supposing we have an attack of *anæmia*, attended, as it often is, with excessive irritability of the heart, we must not only give steel and other tonics, which are the specific remedies for the diseased condition of the blood, but we must also very often add digitalis, in order to lower the action of the heart, which might otherwise be attended with serious results. So also in giving tonics and stomachics, it is often necessary to guard against their astringent effect upon the bowels, by uniting with them a mild aperient; while the coldness of other remedies will require the addition of spice, or some alcoholic or ethereal preparation such as a warm tincture, or sal-volatile. The great point to be attended to, as a *rule*, is to avoid combining together remedies of similar effect, because then we cannot judge which is to be regarded as the active portion; but when two of totally different quality are used, it is impossible to be deceived, and the calculation is not in any way disturbed. Thus, supposing steel and digitalis are used together, and the exhibition of the remedy is followed after a day or two by fainting and other symptoms of a failure in the action of the heart. No one could for a moment doubt that to the digitalis this must be ascribed; while if headache or feverishness had been observed, the steel might fairly gain the discredit. Again, it is often desirable to act upon all the secreting organs, or as many of them as possible; and here it would be quite rational to give saline purgatives known to act in small doses as diuretics, or to be followed by that effect when given in full doses, combining with them spirit of nitric ether, in the hope of ensuring this desirable action on the kidneys. Another case in which a combination of remedies is better than a single drug is to be met with in aperient medicines, where it is desirable to act upon the whole length of the intestinal canal. Here it is found that some (as, for instance, rhubarb) act chiefly on the small intestines, while others (as aloes) confine their operation on the lower bowels; and, therefore, in order to form an efficient general aperient, the compound rhubarb pill is prescribed, consisting of both these drugs united together by means of soap, and with the addition of myrrh and oil of caraway to prevent griping. If, therefore, the list of drugs in a prescription does not include more than such a number as is mentioned above, and as will not interfere with each other, the true principle of prescribing is sufficiently attended to, and efficiency is not sacrificed to the modern cry for simplicity which has been set up, and which is *now* wholly unnecessary, although I admit in former times it might have been richly deserved.

1122. Almost all Medicines are nauseous, and more or less disagreeable to the palate; but there are many degrees in this respect, and some medicines are more obnoxious to certain individuals than others which are generally considered the worst. It often happens that there is a choice, as when two medicines are equally efficacious, and here the least disagreeable should be selected, and will on that account alone very often do more good. There are, however, some palates which seem to be utterly regardless of pain and pleasure, and others upon which a disagreeable effect must be produced, or the remedy will be pronounced inert; but these are exceptions, and the great bulk of mankind are grateful for any mode which will relieve them of the nauseous consequences of swallowing drugs. It is, therefore, the duty of the prescriber to compound these remedies in a form as little unpleasant as possible, using pills wherever the drug is capable of that method of employment, and making liquid medicines as "elegant" as possible. This term may be considered wholly inapplicable to drugs in any shape; but it has long been used to signify that condition in which they are presented with as little disgust to the eye, palate, and nose, as can possibly be effected. No one should sacrifice efficiency to this desire for "elegance;" and certainly it is a fraud to give "bread pills" or "globules," when all the time it is believed or known that the remedy is inert; but, on the other hand, no effort should be spared to cover the nasty taste which has been wisely given to drugs to prevent our using them too frequently.

SECT. 2.—PRACTICE OF PRESCRIBING.

1123. In carrying out the principles alluded to in the last section, it will be found that the following formulas will be useful. They are arranged according to the classification adopted by Dr. Headland, and given at pages 189, 190, and 191.

SUB-SECT. A.—RESTORATIVES.

1124. *Alimentary Restoratives.*—This class of restorative substances act chiefly by affording the proper kind of material for restoring the blood to a healthy condition (see par. 638 *a*).

Take of Cod-liver oil, from a tea-spoonful to a table-spoonful.
Infusion of cloves, one or two table-spoonfuls.

Mix, and give three times a day; *Or*, any of the various kinds of diet enumerated at pages 246—250.

1125. *Acid Restoratives.*—For remarks on these substances, see par. 638 *b*.

Take of Diluted hydrochloric acid,
Diluted nitric acid, ā ʒj.
Tincture of cardamoms, ʒss.
Water, ℥vij.

Mix, and give two table-spoonfuls three times a day. (*In some forms of dyspepsia, and general want of tone.*)

Or, take of fresh lemon-juice, ℥ss.
And give it *neat* every two hours. (*In acute rheumatism, or in some forms of dyspepsia, in which there is what is commonly called "a foul state of the blood.*")

1126. *Alkaline Restoratives.*

Take of solution of potass, ʒj.

And give once or twice a day in table-beer. (*Useful in some of those chronic conditions of the kidneys, where lithate of ammonia is very freely secreted in the urine.*)

Or, give soda water or potass water, in varying quantities.

(*In certain forms of dyspepsia.*)

1127. *Tonics* (*including stomachic bitters*).—Tonics are substances, the continued use of which in debility of the system imparts strength and vigour without causing any sudden excitement. They are generally stimulants as well, inasmuch as they rouse the vital energies; but the excitement is not so rapid as in those called general stimulants, and the effect, also, is more permanent. No medicines require more tact in their selection, and in suiting them to the time when they are to be adopted, for it is far more easy to do harm than good in applying them. Thus, it is generally a rule that quinine will not be borne with a dry tongue, and yet in some cases of typhus fever, if the physician waits for this feature to change before giving quinine, he will wait until his patient is departed to the next world. Some tonics, as arsenic, which are very powerful, but easily misapplied, are omitted hero altogether.

Take of Sulphate of quinine, gr. viij to xij.
Diluted sulphuric acid, minims xij.
Tincture of cardamoms. ʒss.
Water, ℥viiss.

Mix, and give two table-spoonfuls three times a day. (*Generally useful.*)

Or, take of—

Sulphate of quinine, gr. viij.
Extract of chamomile, gr. xij.

Mix, and divide into eight pills, one to be taken three times a day;

C*, take of—

Decoction of cinchona, ℥xi.
Compound tincture of bark, ℥j.

Mix, and give three table-spoonfuls once or twice a day;

Or, take of—

Liquor of potass, ʒj.
Tincture of cardamoms, ℥ss.
Infusion of rhubarb or senna, ℥iss.
Infusion of gentian or cherayta, ℥v.

Mix, and give two table-spoonfuls twice or thrice a day;

Or, take of Trisnitrate of bismuth, gr. v.

Make into a pill with confection of roses, and give for water-brash or for organic disease of the stomach, sometimes joined with an anodyne;

Or, take of—

Extract of dandelion,
Extract of gentian, ā ʒss.
Powdered ginger, gr. viij.

Mix, and divide into sixteen pills, two to be taken twice or thrice a day. (*For dyspepsia, in which the liver is torpid.*)

Or, take of—

Infusion of cascarilla, ℥viij.
Tincture of ginger, ʒij.
,, rhubarb, ʒvj.

Mix, and give two table-spoonfuls twice a day. (*In those forms of dyspepsia where the stomach requires a warm tonic.*(

1128. *Chalybeate Restoratives.*—For remarks see page 189.

Take of Citrate of quinine and iron, gr. xl.
Bicarbonate of soda, ʒiij.
Tincture of cardamoms,
Syrup of orange peel, ā ℥ss.
Water, ℥vij.

Mix, and give two table-spoonfuls three times a day, with one of lemon-juice, while effervescing. (*A most useful form in anœmia, chlorosis, and other diseases generally attended by dyspepsia.*)

Or, take of Carbonate of iron, gr. x to xxx.

Mix in treacle and water, or other vehicle, and give three times a day;

Or, take of Syrup of iodide of iron, ʒj. And give three times a day, in a glass of water;

Or, take of—

Compound mixture of iron, ℥viij.
Tincture of digitalis, ʒj.

Mix, and give two table-spoonfuls three times a day, in anœmia or chlorosis, in which there is palpitation of the heart. (*The digitalis should be carefully watched, and omitted if the lips become white, or there is any tendency to faintness.*)

1129. *Solvent Restoratives.*—The action of these remedies is explained at page 190.

Take of Acetate of potass, ℥ss.
Tincture of benzoin, ʒj.
Water ℥viiss.

Mix, and give two table-spoonfuls three times day.

SUB-SECT. B.—CATALYTICS.

1130. *Antiphlogistics.*—These remedies act by reducing the heat of the body, by means of their action on the heart and large vessels. They are sometimes called *febrifuges* and *refrigerants.*

Take of Carbonate of soda or potass, gr. xx.
Spirit of nitric ether, dr. xxx.
Syrup of orange-peel, ʒj.
Water, ℥j.

Mix, and give with 15 grains of citric or carbonic acid, or a table-spoonful of lemon-juice, while effervescing. (*This is the common medical effervescing draught.*)

Or, take of—

Nitrate of potass, ʒj.
Spirit of nitric ether, ʒiij.
Tincture of henbane, ʒij.
Liquor of acetate of ammonia, ℥j.
Camphor mixture, enough to fill up an eight-ounce phial.

Give two table-spoonfuls every four hours. (*A good common febrifuge mixture*). If cough is present, or if it is for any other reason desirable to act very energetically, add ten or fifteen drops of ipecacuanha or antimonial wine to each dose.

1131. *Antiscrofulics.*—The name here, as in most cases in this sub-section, indicates the use of these remedies:—

Take of Iodide of potassium, ʒj.
Compound essence of sarsaparilla, ℥j.
Water, ℥vij.

Mix, and give two or three times a day.

Or, give the cod-liver oil as ordered at par. 1124.

Or, give the solution of potash with beer, as ordered at par. 1126.

1132. *Anti-arthritics.*—Used in rheumatic and gouty affections of the joints.

Take of Wine of colchicum, ʒij.
Nitrate of potass, ʒj.
Tincture of henbane, ʒij.
Spirit of nitric ether, ʒijss.
Camphor mixture, ℥vij.

Mix, and give two table-spoonfuls every four hours;

Or, take of—
Powdered colchicum root, gr. iij to v.
Powdered opium, gr. ss to gr. j.

Mix, and give as a powder or pill two or three times a day;

Or, give the lemon juice as directed at par. 1125;

Or, the acid mixture as ordered at par. 1125.

1133. *Antiperiodics.*—These consist chiefly in the salts of cinchona and arsenic, which last has a powerful effect, but is scarcely fit for domestic use. The formulæ for the exhibition of quinine and bark are given at par. 1127; but in periodic diseases, like ague, brow-ague, &c., it is often necessary to give double and even treble the above doses.

1134. *Anti-convulsives.*—These comprise the medicines which act specifically upon convulsive diseases, such as epilepsy and chorea, and comprise the salts of arsenic, silver, and zinc, the last-mentioned being the only one which would be at all safe in the hands of any but the regularly educated physician.

1135. *Antispasmodics* indicate their use by their name; but as spasm is caused in a variety of ways, so it requires very different remedies for its removal. Sometimes one, sometimes another, will be the proper one of the following list—viz., narcotics, sedatives, stimulants, nauseants, aperients, stomachics, and tonics; as well as blood-letting and the hot-bath. But, besides the above, there are certainly some few remedies which are peculiarly antispasmodic in their action without possessing any of the above qualities, such as asafœtida, galbanum, and valerian; and these may, therefore, be considered more especially to belong to this class of remedies.

Take of Compound galbanum pill, gr. v to x two or three times a day;

Or, take of—
Tincture of lavender,
Fetid spirit of ammonia, āā ʒss to ʒj.
Camphor mixture, ℥j.

Mix, and give when the spasms are urgent.

1136. *Antisquamics* include those medicines which have a peculiar and specific effect upon scaly diseases of the skin. Arsenic is the chief of these, but it must be used with great care.

Take of Fowler's solution of arsenic, min. v.
Tincture of cardamoms, ʒj.
Water, ʒvij.

Mix, and give three times a day on a *full stomach*;

Or, take of pitch, gr. x to xx; and form into pills with flour of brimstone, which are all to be taken three times a day.

1137. *Anti-acids* are medicines which are intended to correct acidity of the stomach and digestive organs by chemically neutralizing it; their action is only temporary and palliative, as they do not strike at the cause, but only remove the effect; indeed, by constant use, they appear to increase the quantity of acid developed, and thus to aggravate the disease. Whenever they are given for any length of time, vegetable tonics should be combined with them, so as at the same time to improve the tone of the stomach, and prevent the formation of acid. When there exists much flatulence, in combination with acidity, a volatile alkali (ammonia) must be adopted, so as to act in a gaseous form, and thus neutralize the gaseous acid which distends the stomach. In acidity of the lower bowels, attended with distressing distension, magnesia or lime may be used advantageously, inasmuch as they are less likely than soda or ammonia to be absorbed before they reach those parts. Where the ordinary and predominating acid of the urine is in excess, carbonate of potass is the best remedy, inasmuch as its combination with lithic acid is more soluble than is the case with soda.

Take of bicarbonate of ammonia, gr. v. dissolved in an ounce of infusion of columba or gentian, and given two or three times a day. (*In flatulent dyspepsia.*)

Or, take of—
Bicarbonate of soda, gr. v.
Aromatic spirit of ammonia, min. xxv.
Tincture of gentian, ʒj.
Camphor mixture, ℥j.

Mix. (*In dyspepsia, from intemperate living.*)

Or, take of—
Chalk mixture, ℥j.
Tincture of catechu, ʒss.
Tincture of opium, min. viij to xij.
Aromatic confection, gr. x.

Mix. (*In diarrhœa, with acidity.*)

Or, take of—
Lime-water, ℥ss.
Aromatic confection, gr. x.
Almond emulsion, ℥j.

Mix. (*In pain of the stomach, with acidity.*)

SUB-SECT. C.—STIMULANTS.

1138. For a long list of these remedies, and their action on the system, see page 190. The following are common useful formulas:—

Take of Sesquicarbonate of ammonia, gr. v to viij.
Compound tincture of lavender, min. xx.
Sulphuric ether, min. xxx.
Camphor mixture, ℥j.

Mix, and give when a stimulant is required in cases of emergency;

Or, take of—
Compound tincture of valerian, ʒj.
Compound tincture of lavender, ʒss.
Camphor mixture, ℥j.

Mix, and use in hysteria or any other similar affection requiring a warm stimulus;

Or, take of Compound galbanum pill, gr. v.

Make into a pill, and give twice a day.

Or, take of—
Spirit of turpentine, ʒij.
Fetid spirit of ammonia, ʒiss.
Olive-oil, ℥ss.

Mix, and use as a stimulating enema, with a pint of gruel.

SUB-SECT. D.—NARCOTICS.

1139. As almost all the remedies under this head are of a dangerous character in any dose which will produce their specific effect, no formulas can with safety be here given.

SUB-SECT. E.—SEDATIVES.

1140. *General Sedatives* primarily depress the vital powers, without inducing any previous excitement, and from this action being the reverse of stimulants, they are sometimes termed *counter-stimulants.* But the only remedies of this class which are at all safe to be trusted in the hands of non-medical persons are tobacco and diluted hydrocyanic acid. The former of these is only manageable by means of smoking, which, though prejudicial as a general practice, may sometimes be used with advantage. Hydrocyanic acid is a violent poison in large doses; but in very small doses, cautiously used, it is one of the most innocent of all remedies, and may be employed without risk in the sickness which accompanies pregnancy, or in other ordinary cases in which a sedative is required. The following formulas must be used with great caution :—

Take of Diluted hydrocyanic acid, min. ij to iij.
Syrup of orange peel, ʒj.
Distilled water, ℥j.

Mix, and give occasionally, the intervals never being less than six hours.

Or, take of—
Diluted hydrocyanic acid, ʒij.
Glycerine, ʒiij to ʒvj.
Water, ℥vij.

Mix, *and use as a lotion*, taking great care that it is not drunk by mistake. (*Useful in obstinate itchings without apparent cause.*)

Colchicum may be given in the formula directed at par. 1132.

1141. *The Special Sedatives*, including antimony, ipecacuanha, and digitalis, can only be used with safety in the doses, which will act in this particular manner, by the skilled practitioner of medicine.

SUB-SECT. F.—ASTRINGENTS.

For the action of these remedies, see page 188.

1142. *Formulas for Mineral Astringents :—*

Take of Diluted sulphuric acid, min. xx to xxx.
Tincture of cardamoms, min. xx.
Infusion of roses, ℥j.

Mix, and give three times a day. (*In internal hemorrhage.*)

Or, take of—
Diluted sulphuric acid, min. xxx.
Laudanum, min. x.
Water, ℥j.

Mix, and give every three or four hours. (*In diarrhœa.*)

Or, dissolve as much alum as cold water will take up, and use externally as an astringent wash or injection.

Or, take of—
Acetate of lead,
Sulphate of zinc, ā gr. v to x.
Tincture of opium, ʒij.
Water, ℥ij.

Mix, and form an astringent wash or injection in leucorrhœa, &c.

1143. *Vegetable Astringents.*

Take of Compound tincture of camphor, min. xxx.
Decoction of logwood, ℥iss.

Mix, and give after each loose motion in diarrhœa ;

Or, take of—
Tincture of matico, min. xx to xxx.
Sage tea, ℥j.

Mix, and give every four hours in hemorrhage ;

Or, apply matico leaves soaked in warm water to a bleeding wound.

Or, take of gallic acid, gr. v, and give as a pill three times a day in hemorrhage.

SUB-SECT. G.—ELIMINATIVES.

1144. *Sialogogues* include several medicines mentioned at page 191, but formulas are scarcely required for their use.

1145. *Expectorants* excite and promote a discharge of mucus from the lining membrane of the bronchial tubes, thereby relieving inflammation or congestion. They act in two ways :—first, by removing the constriction of the vessels, on which principle nausea seems to give relief; and, secondly, by stimulating these vessels, their natural secretions when deficient are restored; or when they are in an unhealthy state they are changed to a natural condition.

Take of Ipecacuanha wine, ʒiij.
Syrup of tolu, ʒv.
Mucilage of acacia, ℥j.
Water, ℥vj.

Mix, and give two table-spoonfuls every four hours.

Or, take of—
Pill of squill,
Compound ipecacuanha powder, ā ʒj.

Mix, and divide into twenty-four pills, one to be taken every four or six hours.

Or, take of—

Compound tincture of camphor,
Ipecacuanha wine, ā ʒiij.
Olive-oil, ʒv.
Oxymel of squills, ʒiij

Mix, and give a tea-spoonful when the cough is troublesome.

Or, take of roughly powdered spermaceti, mixed up with syrup of poppies and vinegar in equal proportions. (*This is an admirable expectorant remedy in the common coughs of children.*)

Or, take of—

Powdered ipecacuanha, gr. j.
Powdered opium, gr. ss.
Pil. of squill, gr. ij.

Mix. Made into a pill and given at night, this is sometimes a useful pill to quiet those troublesome coughs which come on at that time; but it must only be given to those who are known to be able to take opium.

1146. *Cathartics*, called also *purgatives* and *aperients*, are those medicines which increase or hasten the evacuations from the bowels. They vary greatly in their nature and power, some acting chiefly upon the upper bowels, as rhubarb; others upon the whole course, as jalap and senna; while a third set chiefly act upon the lower bowels, as aloes. Scammony is a very irritating medicine, and is therefore called a *drastic* purgative, together with some others. Epsom and Glauber salts, as well as jalap, produce a large secretion of watery fluid, which washes out the whole canal, and often does nothing more; so that one chief purpose of this kind of medicine is omitted. All aperients when intended to act energetically should be given on an empty stomach; as, for instance, when it is supposed that there is a lodgment in the bowels, or if the whole system is loaded, and requires a reduction. In such a case a strong and generally searching aperient is demanded, and nothing here answers so well as mercury united with some aperient drug or drugs, which produce an effect upon the whole canal. Neither aloes nor rhubarb by themselves are sufficient for this purpose, because they might either of them leave a part of the canal still loaded; but together they seem to do their duty extremely well. In the following list will be found several useful formulas for aperients, when required in this way. Unfortunately, however, these purgative drugs act solely by their power of irritation, and, as a consequence, they weaken the tone of the mucous membrane, and produce nausea, loss of appetite, and flatulence when frequently exhibited. In addition to which, they leave the bowels, after each dose, in a worse condition than before; and so go on gradually increasing the evil, until at last the unhappy victim is rendered perfectly miserable. Such is a very common event in England, and especially among those who lead sedentary lives, and who expect still to be able to indulge in the luxuries of the table by the aid of a blue pill and black draught, which remedies for a time have the desired effect, but a heavy reckoning has afterwards to be paid in the shape of some one or other of the many forms of dyspepsia so common in this country. No one can possibly safely carry off large quantities of food without exercise, if they are taken for years together. The choice is, therefore, between dyspepsia, occasioned by purgatives, or else that form established by nature to diminish the appetite, or perhaps a worse disease in the shape of organic mischief in the liver or kidneys. Aperients are, therefore, perhaps the best remedies for such a state of things, short of temperance in living, which some people seem to put entirely out of the question. But supposing the mischief done, and a habit of constipation established, it becomes a question how this may best be relieved. It is generally in this country brought about in some way or other by the constant use of purgatives, though I have known some cases in which it appeared to be congenital, and the constipation to have existed from the earliest period of life. In every case, however, the difficulty is the same, and must be met; and I will now endeavour to show the best mode of accomplishing this troublesome task. In the first place, blue pill and calomel, although highly valuable as rare resources against obstinate constipation, with torpid liver, are objectionable altogether as daily, or even as weekly medicines; because they destroy the tone of the mucous membrane, and also act in a most injurious manner upon the nerves, being a fertile source of neuralgia. Senna is a very useful and mild aperient, but its bulk renders it unfit for anything but the infusion or electuary, both of which are nauseous in the extreme. Saline medicines produce flatulency and loss of tone, and cannot long be employed without injury. In fact, whatever is put into the stomach in an empty state has a strong tendency to weaken its tone. Nature teaches us by example that animals seek a change of food when out of order, and our own stomachs prompt us to follow in their wake; thus, green vegetables are always welcome to the strong stomach when the bowels are confined, but the weakly one is incapable of digesting them. If, then, we imitate the natural instinct, *and mix with our food* some mild *vegetable* aperient, which shall also act on the liver, we shall avoid all irritation of the stomach, and yet produce a regular action of the bowels. In this way these medicines may be considered as supplying the place of green food, or as acting in the same way, but more energetically. No one would complain of cabbage or carrots being taken daily all through the year, or even of figs, prunes, or other fruit. But the moment it is advised that a daily dose of rhubarb should be mixed with the food, a certain amount of horror is evoked, which varies with the degree of mischief which the abuse of drugs may have occasioned. I fully believe that blue pill, or senna, or jalap, or aloes, *given as a medicine* on an empty stomach, is highly prejudicial to health; but I am as fully convinced, from twenty years' experience, that rhubarb and ipecacuanha may be administered *as a part of the daily food*, not only without injury, but with positive benefit, as compared to the state without them. But they must be given in the form of pills, and swallowed either with, or immediately after, the food, and not before, or long after, because in the former case the stomach is empty, and in the latter it is full of half-digested food, and therefore inclined to be captious, and easily disgusted or nauseated. If those who suffer from torpid liver and bowels will only give this method a trial, they will bless the day they first began it, and will abandon blue pills, black draughts, &c., as perfectly unnecessary and unfit for the office which they profess to fill. The rule is to take as much ipecacuanha as the stomach will bear (using from half a grain to a grain), together with as little rhubarb as will act gently on the bowels, made into one or more pills, and given either with breakfast or dinner, or both, according to the necessity for aperients. This should be persevered in as long as the bowels continue to be confined, diminishing or increasing the dose of rhubarb as may be wanted. The action is not very rapid, and some days are required at first before it is fully developed; after which it is readily kept up by the regular use of the pills, a formula for which is given below. By the use of them I have succeeded in numberless cases in entirely superseding mercury, and in curing neuralgia, dyspepsia, headaches, and a host of those evils attendant upon constipation, and its usual remedies.

Take of Powd. Rhubarb, gr. iij to xv.
,, Ipecacuanha, gr. ss to j.
,, Ginger, gr. ss.
Water to form 1, 2, or 3 pills.
To be taken with breakfast or dinner, or both. (See remarks above.)

Or, take of—
Blue pill, gr. iij to v.
Compound rhubarb pill,
Extract of colocynth, ā gr. iij to viij.
Mix, and form into two, three, or four pills.

Or, take of—

Sulphate of magnesia,
Tincture of senna, ā ʒjss to ʒij.
Infusion of senna, ℥jss to ℥ij.

Mix, and form a draught. (*This is the common black draught.*)

Or, take of—

Powdered jalap, gr. x.
Sub-carbonate of soda, gr. viij.
Manna, ʒj.
Tincture of senna, ʒij.
Epsom salts, ʒij.
Infusion of senna, ℥jss.

(*This is a very powerful aperient draught.*)

Or, take of—

Epsom salts, ℥ss to ℥j.
Cream of tartar, ʒij.
Half a lemon (juice and peel).
Boiling water, 1 quart.

Half a tumbler to be taken in the morning daily;

Or, take of—

Calomel, gr. iij.
Jalap and rhubarb, ā gr. x.

Mix, and make into an aperient powder for the adult. (*The whole or a part of this may be given as an active aperient to any child or young person, according to the table given at page* 222.)

Or, take of—

Compound decoction of aloes, ℥j.
Infusion of senna, ℥ss.
Tincture of rhubarb, ʒij.

Mix, and make a draught.

Or, take of—

Castor-oil,
Tincture of rhubarb, of each a dessert-spoonful or table-spoonful.

(*A very mild and safe aperient in colicky pains.*)

Or, give ½ gr. of podophyllin with 4 or 5 grs. of compound rhubarb pill.

The formulas for *cholagogues*, the action of which is explained at page 191, are included among the cathartics given at par. 1146.

1147. *Diaphoretics* are medicines which increase the insensible perspiration. When they act very energetically, they are called *sudorifics*. During the administration of these remedies, it is essential that the surface of the body should be kept warm, and for this purpose wool is generally employed in the shape of flannel or blankets. Exposure to cold air is also to be avoided, as well as the drinking of cold water, though this in strong constitutions is often productive of extensive perspiration, and many people take a glass of cold water at night before going to bed with the view of producing perspiration when they feel that they have taken cold. In order to check excessive sweating, it is a bad plan to expose the body while bathed in it, or while clothed with damp garments; but these should at once be removed and dry ones of a lighter character put on, or else the clothing should very gradually be made lighter, avoiding any sudden transition which would be likely to produce a chill:—

Take of antimonial powder (compound powder of antimony), gr. v.

To be given at night, with a basin of warm gruel, or white wine whey.

Or, take of Dover's powder (compound powder of ipecacuanha) gr. v to x.

To be given at night, when there is no fever, and the bowels are open.

Or, take of—

Liquor of acetate of ammonia, ʒj.
Ipecacuanha wine, min. x.
Sweet spirit of nitre, min. xx.

Mix, and give at night, or oftener, if necessary, in a glass of water.

1148. *Diuretics* augment the secretion, and promote the flow of urine. In slight stoppages of this secretion, there is no great harm in trying mild diuretics, such as the following; but where the disturbance is great, it is better to leave the case in the hands of a competent authority, as much mischief may easily be done from the selection of an improper remedy—as, for instance, in using a stimulating diuretic in case of inflammation of the kidneys.

FORMULAS FOR DIURETIC MEDICINES:—

Take of Nitrate of potass, gr. x.
Spirit of nitric ether, ʒj.
Spearmint water, ℥j.

Or, take Imperial (see page 250), of which half a tumbler may be given, with or without a table-spoonful of gin, two or three times a day.

Or, take of a strong infusion of the peel of the younger branches of the elder tree, made with the addition of half an ounce of cream of tartar to each pint; and of this infusion two or three ounces may be given three times a day. (*In dropsy and suppression of urine.*)

SUB-SECT. II.—MISCELLANEOUS FORMULAS.

1149. ANTHELMINTHICS being chiefly required in childhood are not given here, but will be found at page 330.

1150. EMBROCATIONS are intended to relieve local pains, either by counter-irritation or by the anodyne effects of their ingredients, or by aiding the friction which cannot long be maintained without some such application.

Take of Liquor of ammonia, tincture of opium, spirit of turpentine, and olive-oil (or soap liniment), of each equal parts. (*Useful for rheumatism or any local pains.*)

Or, take of—
Flour of mustard, ℥ss.
Vinegar, boiling, ℥iij.

Mix, and rub into the part to produce counter-irritation.

Or, take of laudanum, chloroform, and soap liniment, equal proportions. (*This will often relieve local pains.*)

Or, take chloroform, which may be applied alone, sprinkled on a piece of spongio-piline, to the part in neuralgia, great care being taken not to inhale its vapour long together.

All embrocations may be applied with good effect by wetting with them the inner surface of spongio-piline, and keeping it to the part. In this way, as the ammonia cannot evaporate, embrocations used with its assistance are much more active.

1151. FOR BLISTERS, ISSUES, CAUSTICS, &c., see page 261, 262.

1152. EMOLLIENTS are those remedies which relax the tone of parts and make them more soft and yielding. Poultices and warm-water fomentations are chiefly those which may be adopted in domestic practice, and they will be found serviceable in many slight cases of inflammation from various causes. Bread or linseed-meal poultice is an excellent emollient, as also is the fomentation made with poppy-heads, and applied by means of flannel wrung out in it (see page 262.) Internal emollients include — linseed tea, mixture of gum acacia, rice-water, chalk-mixture, &c.

1153. EMETICS are used to produce vomiting; but it is rarely the case that they are desirable in the hands of those who are not fully qualified to judge of the propriety of giving them. When, however, a child is known to have swallowed any foreign body, or to have evidently disordered the stomach by grossly improper food recently taken, a simple emetic is quite justifiable; or in cases of croup, fever, or active inflammation, when no time is to be lost, it may be had recourse to. The only justifiable drug for this purpose is powdered ipecacuanha, or ipecacuanha wine, or sometimes antimonial wine, which may be given in proportion to the age, or mustard.

Take of powdered ipecacuanha, gr. xv to xxx.

And give mixed in water or tea, followed by plenty of lukewarm water.

Or, take of ipecacuanha wine, ʒij to ʒiv.

Or, take of antimonial wine, ʒij to ʒiv.

Or, take a tea-spoonful of mustard mixed in a pint of water, and give it in four portions, at intervals of a few minutes.

(*Remarks.*)—In producing vomiting, if the above remedies do not act in a quarter of an hour, they may be repeated every quarter until the desired effect is produced.

CHAP. III.

TREATMENT OF FEVER IN GENERAL.

1154. **The Treatment of Fever** depends so entirely upon the kind or form of that disease which happens to exist in any particular case, that no general rules can possibly be given. Remedies which would be suitable to an attack of intermittent fever, would do great mischief if given during the early stage of typhus, or in any of the eruptive fevers, and more particularly also in the sympathetic fever, which accompanies local inflammation. Orthodox medicine does not pretend to cure diseases by any single remedy, like the quack who vaunts his water, or his universal vegetable medicine, as being capable of blowing hot, warm, or cold according to his orders. It is content to ascertain by experiment what particular class of remedies is called for in each disease, and to apply them as long as it is found that by their means its progress towards a cure is accelerated, and a fatal termination is rendered less frequent. It may be sufficient, therefore, to conclude that, in the present state of our knowledge, no rule can be laid down by which fever in general can be treated with advantage. Nevertheless, it may be remarked that there is one caution which should be kept constantly in view, namely, that as fever is now believed to be an effort of nature to get rid of a poison from the blood, so it is impossible to cut it short without leaving that poison still lurking in the body. We may find in some few cases, such as ague, that we can effect our purpose by a specific (quinine); but, as we know nothing of the way in which this acts, we cannot possibly, even theoretically, guess at the best means of effecting the same purpose in other fevers. Numberless plans of treatment have been devised and tried, but the result is that, when tested by statistical returns of large numbers of cases, those in which little or nothing has been done, have been least fatal; while, on the other hand, interference has been followed by ill success, in proportion to the complexity of its method, and the powerful nature of its remedies.

1155. **The only Rule**, therefore, which can be laid down in all fevers (except intermittents) is to interfere as little as possible with the symptoms peculiar to the fever itself, but to place the patient in the best possible condition for fighting his battle in expelling his enemy (the febrile poison). To do this in the best manner, several things are necessary, namely—1st, plenty of fresh air by means of a large ventilated room; 2nd, good nursing, which implies a regular supply of everything at the moment it is wanted, and also a proper treatment of the mind by sustaining hope and amusing the patient without over-excitement; 3rd, attention to the secretions with a view to encourage their natural action, as far as it can be done, without using means which in themselves are injurious; and 4th, the careful watching for, and guarding against, the ill effects of those local complications, which are constantly occurring in all fevers, from the common ephemeral fever in which what is called "a cold," or "a cough," is the usual complication, to typhus, in which the brain, the lungs, and the bowels are all threatened with severe mischief.

CHAP. IV.

TREATMENT OF CONTINUED FEVER.

SECT. 1.—SIMPLE OR EPHEMERAL FEVER.

1156. The treatment of this kind of fever (page 24) should be conducted on the strictest principles of allowing nature to do her own duty. But carrying out the instructions given in the last chapter, it is necessary, in order to place the patient in the most favourable circumstances, to give—1st, entire rest to the whole body, and this should be in bed, if possible, or if not, in a room of a moderate and equable temperature; 2nd, plenty of fresh air, avoiding cold draughts of it upon the skin; 3rd, little or no food, the time during which the disease lasts being so short as to allow of this rule being applied almost to the letter; what food is thought necessary should be of the mildest farinaceous kind, and the drink should be toast and water, or in some cases, lemonade or imperial; 4th, as nature seems to cure this disease by establishing an increase of some one or more of the secretions, it is theoretically, as well as practically, right to assist her, by keeping the bowels gently open, and producing also a similar effect upon the kidneys and skin. If the liver is not acting, as shewn by the yellow colour of the skin and eyes, an attempt should be made to procure a proper flow of bile, either by means of a cholagogue (see page 348), or of an emetic (see page 349), which will be found to be of great service in relieving this kind of fever; though, as it tends to weaken the stomach, its use should not be attempted, except in urgent and very severe cases. When the bowels, and the liver in particular, have been thus gently relieved, it may be prudent to act on the kidneys and skin by means of a mild diaphoretic, which may often be combined with a diuretic, so that both organs will aid in relieving the blood. The following is an excellent formula in this disease, beginning after the bowels are moved:—

Take of Nitrate of potass, ʒj.
Spirit of nitric ether, ʒiij.
Liquor of acetate of ammonia, ℥j.
Tincture of henbane, ʒij.
Camphor mixture, ℥vj.

Mix, and give two table-spoonfuls three times a day. A more special diaphoretic may be given at night, such as the antimonial powder, or the compound ipecacuanha powder; but I much doubt their superior advantage over the above mixture. If, in spite of these aids to nature, a complication occurs in the shape of congestion in the mucous membrane of either the nasal cavities, or the bronchial tubes, or the intestines, or sometimes in the bladder, the treatment of these several local attacks must be conducted on the plan which will be found laid down under the several heads of *bronchitis*, *diarrhœa*, *catarrh* of the bladder, &c. That of the nose will very seldom require anything but time; and, indeed, in most cases the same may be said of the others here alluded to, if the patient is tolerably healthy, and will only avoid aggravating them by exposure to the weather, and by the use of improper diet.

1157. THE HYDROPATHIC TREATMENT of this form of fever is, I believe, attended with the happiest results; but, as I have remarked, it is seldom carried out with advantage anywhere but in the regular water establishments, and as these cannot often be reached in proper time, and as the disease is scarcely of importance enough, even if they could, it is scarcely necessary to allude to the method here. Nevertheless, it may be remarked, that those who are already familiar with the use of the "packing process" in its various forms, may have recourse to it with great advantage. The profuse perspiration, followed as it generally is by an excessive action of the kidneys, appears to carry off from the blood the poison which is the essence of the disease, and, at the same time, the lowering effect is not so great as might be supposed. Still it is too powerful a remedy to be lightly indulged in, and only those who have already tried it, under proper advice, should have recourse to it in simple fever.

SECT. 2.—TREATMENT OF TYPHUS.

1158. THE SYMPTOMS of this dreadful disease should be well studied, as described at pages 24, 25, if any person not thoroughly conversant with it attempts to undertake its management. Although I should strongly deprecate such a proceeding, yet there may be situations in which it is advisable, and, therefore, I shall proceed to lay down a few directions in as simple a manner as possible for domestic use, at the same time remarking, that though they may suffice for a great many cases, yet every now and then fresh types of the disease make their appearance, and require a totally different treatment.

1159. THE GENERAL PRINCIPLES upon which typhus fever is to be treated resolve themselves into the following series of directions, which should be strictly attended to throughout the course of the attack—1st, entire rest of body and mind should be enforced, the patient being advised to lie, as far as possible, "like a log" in his bed, and the mind being only sufficiently amused to keep it from preying on itself; 2nd, no attempt should be made to cut the disease short, as it is found to fail in such a large proportion of cases, as to warrant the discontinuance of a practice which, if it does no good, invariably does harm; 3rd, whatever lowering measures may be thought absolutely essential should be cautiously employed only to that point which will serve the purpose in view, remembering always that there is a time to come when all the bodily powers will be required to weather the exhaustion incidental to the disease; 4th, watch carefully for complications, and when they occur, meet them *at once* by such treatment as may be required, remembering that by this plan a mild remedy will suffice, whereas, if postponed, a more powerful one will hardly effect as much good; while it will often do great harm by lowering the powers of the system; 5th, with regard to diet, it must be remembered that, whereas in the early stage the stomach is almost paralysed, and incapable of digestion, yet in the subsequent periods of the disease, strengthening food is absolutely necessary to a cure; 6th, throughout the course of the disease, the greatest difficulty is experienced in procuring a healthy secretion from the various organs, and great caution is required in interfering with them. Slight aid may be afforded sometimes, but it is not to be expected, that by any means these secretions can be restored to a perfectly healthy condition while the disease exists. With these general remarks then, we may now proceed to consider the details of the management of this disease, during the four periods, described at pages 25 and 26.

(*a*) *During the incipient period*, there are two essential indications to be pursued—1st, to remove from the bowels or stomach any irritating and half-digested food which would otherwise remain there and prove a source of mischief; and 2nd, to abstract blood, if it appears probable that there is such a superabundance of this fluid (for instance, in a plethoric subject) as to lead to local complications at a subsequent period. In order to carry out the *first indication*, if the liver appears to be acting freely, it is only necessary to give a dose of castor-oil, or a common Seidlitz-powder; but, on the other hand, if the skin is yellow, an emetic will often be of great service, consisting in an adult of average strength of the following powder, which is better than the same in solution :—

Take of Tartar emetic, gr. j.
Powdered ipecacuanha, gr. xv to xx.

Mix, and give as a powder in water or tea. After the emetic has done its duty, and the bowels are relieved of their load by the aid of the aperient, little more should be done, unless the state of *plethora* mentioned above exists to such an extent as to induce us to abstract blood. Formerly, this was the practice in almost all cases of fever, but it is now found to be rarely required, and to do harm rather than good in the majority of instances. It is, therefore, seldom to be thought of without the advice of a competent authority; and with the exception of the attention to the liver and bowels, as above directed, it will not be needful to do anything in the way of physic at this period. A simple effervescent draught is grateful to the palate, and relieves, to some extent, the thirst which usually prevails. It may, therefore, be given three or four times a day, prepared according to the prescription given at page 342. Soda-water, if properly made, will answer the same purpose, but it is not usually so grateful to the palate as the fresh lemon-juice. With regard to *diet*, no solid whatever should be allowed from the first onset to the full establishment of convalescence. Gruel, or light chicken-broth, or arrowroot, if the bowels are relaxed, or barley-water should form the sole articles at this time, and toast and water, or thin barley-water, or very weak acidulated drink, made with diluted sulphuric acid, should be the only liquids permitted to quench the thirst. This acid drink is made by adding to one pint of water one drachm of the diluted acid, and sweetening it to the palate.

(*b*) *In the stage of reaction* the indication still is to allow nature to have her way, if that way is restrained within the bounds of safety. Usually, however, it will be found that one or other of the complications, alluded to at page 25, makes its appearance, soon after the end of the first week of the fever, which may usually be assigned as the limit of the first stage. Until one of these shows itself, the plan ordered in the last paragraph (*a*) may be persisted in, that is to say, unless the fever is so high as to warrant general measures of precaution, and then it may be prudent to give tartar emetic in small doses, often repeated, thus—

Take of Tartar emetic, gr. ss to gr. j.
Water, ℥j.

Mix, and give every four hours until the lowering effect is fully produced. At first this remedy always produces vomiting, but it is soon borne by the stomach, and after a few doses the nausea disappears entirely. There is great danger, however, of the tartar-emetic causing diarrhœa, and, on the slightest appearance of it, the drug must be discontinued either partially or entirely, according to circumstances. With regard to the complications, if the *head* is the organ attacked, tartar-emetic is the best remedy, but it need not be employed unless the scalp is hot and the eyes red and suffused, when it may at once be given. A mere delirium at night, or even a slight wandering by day, may be expected in any case, and need cause no uneasiness, or lead to any extra treatment on account of it. A blister to the nape of the neck, or to the top of the head, is also a proper remedy in such a case, and whether the latter plan is adopted or not, the hair should be cropped quite close on the slightest threatening of congestion in the head; while, if the surface is warmer than that of other parts of the body, a cold lotion of vinegar and water may be kept constantly on the head by means of pieces of old linen dipped in it, and constantly changed as fast as they get warm. Ice to the head seldom affords relief, the chill being too great for the congestion, which seems to be the amount of mischief generally going on, although well calculated for active inflammation. If the *chest* is affected, the tartar-emetic may likewise be employed, or if the bowels are at the same time relaxed, ipecacuanha may be substituted. The expectorant mixture, given at page 345, is the best form in this case, using tartar-emetic or ipecacuanha, as the case seems to require either. If there appears to be pneumonia, bleeding, either from the arm or by leeches, must be practised; but in this fever it is now generally admitted that, if possible, blood should not be taken, and, therefore, unless the inflammation is great, neither should be had recourse to. A few leeches to the chest will, however, often give great relief, and will take so little blood as to be of no great consequence.

A blister to the chest may always be considered a safe expedient in this disease, as pleurisy is not common, and whether for pneumonia or bronchitis it is equally advantageous. This complication is a very dangerous one, as the effect of the lowering remedies which are required to relieve the mischief will always be of such a nature as to militate against the safe transit through the next or typhoid stage. When the *bowels* are congested or inflamed, there is either obstinate constipation and defective action in the liver, or there is diarrhœa which is often a most dangerous and troublesome symptom, and associated with ulceration of the intestines. If constipation occurs while the liver appears to be acting, castor-oil is the best remedy, taking care to assist its action by mild enemas; but if the liver does not act, small doses of blue pill or mercury and chalk must precede the oil. It is often a good plan to give one or two grains of the latter by itself once or twice a day until the liver acts tolerably freely; but at all events it may be administered every night or on the evening preceding the oil. If, on the other hand, there is diarrhœa, it must be checked at once by one or other of the astringent mixtures, the formulas for which are to be found at page 345. The chalk-mixture, with aromatic confection and a few drops of laudanum, may be tried (see page 344), or from five to eight grains of the compound powder of ipecacuanha may be given at night. When there is great tenderness of the abdomen a few leeches should be applied, and these may be followed by the application of a large linseed-meal poultice, or it may be used without them. Sometimes there is extensive hemorrhage from the bowels in this complication, when the astringent mixture above alluded to must be relied on as the only safe measure within the scope of domestic practice.

(*c*) *The Typhoid Stage* is the great test of the strength possessed by the patient, and of the resources of medical art hitherto brought into play to afford relief. The indications are, now, 1st, to support the strength at all hazards; and 2nd, to combine with this, as far as is practicable, the use of remedies which shall moderate local congestions. The advent of this typhoid period may be looked for about the end of the second week of the fever, and at this time bark or quinine and wine, or brandy even, will almost always be required. Ammonia will sometimes serve as a stimulant better than alcohol in any form; but as a rule it may be assumed that port wine is the best kind of support, and more especially if given mulled (see page 249). Beef-tea will also be required to be constantly given in small quantities; and I have found that, by the systematic use of bark in some form, mulled port wine and beef-tea, at regular intervals of two hours through the day and night, the worst cases of typhus fever may be expected to recover. It is of no use waiting for the tongue to get moist before giving bark, or wine, or beef-tea, for if we do, we shall often lose the life of the patient; and by their adoption, as soon as this stage fairly sets in, the brown and parched tongue becomes moist, and the symptoms of congestion are often relieved at once. At the same time by the use of cold lotions to the head, and of blisters to that part, or to the nape of the neck, or to the chest or abdomen, local congestions may be relieved. It is to be hoped that by appropriate treatment the pneumonia or bronchitis, which so often occurs in the second stage of typhus, has been relieved, for they are the most troublesome accompaniments in this stage which we are now considering, and their presence is by many supposed to forbid either bark or wine, or even beef-tea; but I am firmly persuaded that it is better to ignore them from the moment that the prostration sets in, which marks the true typhoid condition, and in spite of them to use these remedies freely. It is quite clear to me from long experience, that few cases of typhus will recover unless they are supported through this dreadful stage, and if these remedies are postponed fatal exhaustion will set in; while, on the other hand, it is shewn that even independently of typhus, the stimulating treatment of pneumonia is nearly, if not quite, as successful as the opposite and customary plan. In any case, therefore, I should proceed to give every two hours, first, a dose of one or other of the following mixtures; then two or three ounces of mulled port-wine, and then a like quantity of good beef-tea made according to the plan given at page 247.

Take of Compound tincture of bark, ℥j.
Decoction of yellow bark, ℥xj.

Mix, and give three table-spoonfuls for a dose. In very great exhaustion, from thirty to forty drops of sal-volatile, or four or five grains of sesquicarbonate of ammonia may be added to each dose;

Or, take of—
Sulphate of quinine, gr. j.
Diluted sulphuric acid, min. x.
Infusion of roses, ℥j.

Mix, and give as above ordered. If the debility is extreme, neat port wine, or equal quantities of it and brandy, must be given instead of mulling it, and sometimes in unlimited quantities; one or two bottles of wine a day, will be required in very bad cases, and I have seen some recover when this last quantity has been given by the tea-spoonful at a time, in consequence of the power of swallowing being nearly lost. If diarrhœa shows itself, water-arrowroot may be mixed with the port wine, and also with the beef-tea, and in addition, the astringent mixtures, mentioned in the last paragraph, must be liberally used. During this stage, great attention must be paid to the state of the bladder, which is generally paralysed, and becomes dreadfully distended, requiring the use of an instrument (the catheter) to draw off its contents. The skin of the back must also be carefully examined and protected from bed-sores, as they are called, by the application of the remedies which will be found allotted to them, or by the use of the water-bed, which is the best of all.

(*d*) As the typhoid stage gradually disappears, *convalescence* is established, and here the greatest possible caution is required, as the least want of care will occasion a most dangerous relapse. The most probable cause of this is the gratification of the craving for solid food, or for those liquids which are totally unfit for the weak and exhausted stomach. It is long before any kind of solid food will be safe, and yet the palate becomes so tired of beef-tea and arrowroot, that there is a constant begging for some change. Light puddings, such as those enumerated at page 293, under the letters (*f*) to (*l*), are the best for the purpose, and when the tongue is quite clean, and the fever has entirely disappeared, a small slice of chicken may be tried, and if not injurious, by very slow degrees, a change may be made for boiled or roast mutton, or even for any of the wholesome white fish, but these last should only be ventured on as an occasional variety. The wine and bark will still be required, though not in such large quantities, or so frequently, and as the stomach takes more food at a time, it may be left to itself for three or four hours between meals. By this treatment, the inexperienced nurse or mother may hope to succeed in this direful disease, should they unfortunately be deprived of medical aid; but if they can obtain such as they can rely upon, they had better abstain from all dabbling in such a difficult subject, and follow the injunctions given them with care and exactitude. It must always be remembered that there are several ways, perhaps equally good, of attaining the same object; but, by mixing them, the whole aim and object of the one intended to be pursued, may and will most probably be upset.

1160. THE CHLORIDE OF LIME OR ZINC should be freely used as a disinfectant, throughout the course of the disease, and the linen should be changed daily or every other day. (See *Nursing* and *Contagion*).

CHAP. V.

PERIODIC FEVERS.

SECT. 1.—AGUE OR INTERMITTENT.

1161. THE TREATMENT OF AGUE (for symptoms see page 27) is of a twofold character, being divided into—1st, that adapted to remove the poison from the blood, and which is of a specific nature; and, 2nd, the selection of remedies which are calculated to relieve the paroxysms; and here the rational system comes into play. As these two periods are called the *intermission* and the *paroxysm*, the treatment of each is distinguished in the same way.

(*a*) *In the intermission*, quinine and arsenic are the specifics which have long been found to cure this disease. Iron and zinc have also considerable power; and, on account of their comparative cheapness, they may be preferred in those districts where ague is so rife as to require the perpetual use of an antidote; but wherever life is of value, and labour commands the price of a few grains of quinine daily, this substance will be selected, as not only the most efficacious, but also the most economical remedy. Arsenic acts nearly, if not quite, as well, but the dangerous nature of an overdose must always prevent its general use, though before the discovery of the method of obtaining quinine in a separate form from the native bark, it was the popular remedy. The dose of quinine is from two to four, or even five, grains three times a day, or by some a large dose, consisting of ten or fifteen grains, is given at night only, but the smaller dose at more frequent intervals is generally considered to be the better method. It may be given in pills, but it appears to require a larger dose in this form than in solution to effect the desired object. If given in solution, a small quantity of diluted sulphuric acid (about one drop to the grain) must be added in order to render it soluble in water, but the substance is so light that, if it is stirred up just before it is swallowed, it remains suspended, although not dissolved, and is taken into the stomach without the slightest difficulty. Where it is impossible to obtain quinine, one or other of the metallic salts above mentioned must be used, the doses being as follows—viz., *if arsenic*, from five to twelve drops of Fowler's solution in any bitter infusion three times a day, beginning with the smaller dose, and gradually increasing it until the face swells, or the eyes become red: if it purges, a few drops of laudanum must be united with it. If *iron* is used, one or two grains of the sulphate may be given in solution, or the persesquinitrate has been recommended on the authority of a Canadian surgeon, but its efficacy has not been well tested by others. *Zinc* is given in the form of the sulphate, of which two or three grains may be administered in solution twice a day. In any case, prior to giving either of these specific medicines, the bowels should be acted on by a smart dose of aperient medicine, which prevents in some measure the heating effect of the drug to be used, and also increases the absorbing power of the mucous surface of the intestines. Attention must also subsequently be paid to this point, by taking care that the bowels are neither so confined as to cause fever, nor so relaxed as to carry off the medicine without any of its substance being absorbed into the blood.

(*b*) *During the paroxysm* in this country, little need be done to relieve the patient, as the symptoms are not often so severe as to cause any great distress; but, in hot climates, the cold stage is sometimes so urgently depressing, that if proper remedies are not employed, there is danger of a fatal result, or of serious consequences at all events; while the same remark, though differently applied, may be made also in reference to the hot and sweating stages. When the *cold stage* makes its appearance, the patient should be put into a warm bed, and should be warmed as soon as possible by friction and the use of hot bricks, as well as warm diluent drinks internally. Sometimes the congestion in the internal organs is so great that bleeding is necessary, but this should seldom be attempted, excepting in very plethoric subjects, who have only recently been submitted to the influence of the *malaria*, and who are not thereby reduced in strength. An emetic (see page 349) will answer this purpose much better, and is an excellent remedy in severe cases. As soon as the heat is restored to the surface, and the *hot stage* makes its appearance, the bed-clothes may be reduced to a sheet, if the weather is warm, and fresh air should be freely admitted. Sponging with warm water may be practised with safety, and is a most refreshing remedy. Cold water is also used successfully by some, and the wet-sheet hydropathic remedy (see page 204), is said to be of great efficacy. The patient must still be kept in bed. When the *sweating stage* shews itself, little more is necessary than to avoid sudden chills on the one hand, and the excessive exhaustion caused by over-clothing on the other. As soon as the flow of perspiration appears to be about to cease, the clothes should be changed, and this may be done once or twice with advantage. The process is, no doubt, a healing effort of nature, and should to a certain extent be encouraged; but, nevertheless, it must not be allowed to go on to produce exhaustion, and to avoid this, when nature appears to be inclined to withdraw the secretion, she should be assisted in the effort. If the sweating stage is not easily developed, the following draught may be given, which will seldom fail to produce it:—

Take of Spirit of nitric ether,
Compound tincture of camphor, ā ʒj.
Camphor mixture, ℥j.

Mix, and give as a draught. During the sweating period it is often necessary to give stimulants, but they should be united with some light kind of food. Thus, instead of giving brandy with water alone, it should be mixed with gruel. Mulled port-wine towards the latter part of the time, is an excellent form of support. After the whole paroxysm has passed off, the patient is generally drowsy, and should be allowed to sleep undisturbed for some hours, when the specific treatment adapted to the intermission should at once be commenced (see *a*).

SECT. 2.—ADULT REMITTENT FEVER.

1162. THE ADULT REMITTENT FEVER OF THIS COUNTRY (see pars. 80 and 81) is commonly known as *bilious* or *gastric* fever. The *treatment* of this disease does not vary greatly from that which has been described as suited to typhus fever; but the complication being almost always confined to the alimentary canal, and there being scarcely any "head symptoms," it is only necessary to pay attention to the regulation of the bowels. For this purpose the mildest remedies should be selected, and in this disease, still more even than in typhus-fever, mischief is to be done by unnecessary interference with the salutary effects of nature. In the early stage, if diarrhœa prevails, it may be allowed to go on, unless the motions exceed the number of three or four daily; but after the first week, this irritable condition of the bowels should be carefully watched and checked. Very often the discharges are from the first very offensive, and to relieve the condition of which this is a symptom, vegetable charcoal finely powdered may be given twice a day, in doses of ten or fifteen grains, mixed with water. When it is desired to subdue the diarrhœa, an enema of starch and laudanum should be first tried before having recourse to giving medicine by the mouth. The quantity for an adult is about 20 to 30 drops of laudanum in two or three ounces of starch, which is used in the method described at page 306. If this fails, chalk-mixture, with aromatic confection, and six or eight drops of laudanum may be administered; *or*, the sulphuric acid mixture may be tried, a formula for which is given at page 345; *or*, sometimes small doses of rhubarb and opium will answer better than either, as follows:—

Take of Extract of opium, gr. iss.
Powdered rhubarb, gr. ix.
Bicarbonate of soda, gr. xij.

Mix them with a few drops of water into a solid mass, and divide into six pills, one of which may be given every six hours, If, on the contrary, the bowels are *constipated*, a clyster may be tried, consisting of a pint and a half of gruel, containing a table-spoonful of salt, or a like quantity of brown sugar, or an ounce and a half of castor-oil. Should this fail to procure a sufficient action of the bowels, a small dose of castor-oil, or a mild aperient, consisting of one or other of the forms given at page 348, should be administered, remembering always to guard against over-purgation, which is to be dreaded in this disease, as the forerunner of ulceration of the intestines. It should also be known that medicines generally act in smaller doses in this disease than in most others. If there is obstinate vomiting, the simple effervescing draught (page 342), or soda-water may be tried, or sometimes diluted hydrocyanic acid (page 345), will relieve the irritability of the stomach. A blister to the pit of the stomach is an excellent remedy in this troublesome affection, and, if all other remedies fail, four or five grains of calomel, *by itself*, placed on the tongue, and washed down by a little cold water, will seldom fail to stop it, though its effect upon the bowels after it has passed through the stomach is not to be desired, and therefore it should only be used as a last resource. When the stomach and bowels appear to be in a proper condition, the best thing is to leave the disease to work its own cure, assuaging the thirst by the use of water acidulated with mineral acid, in the following proportion :—

Take of Diluted hydrochloric acid,
Diluted nitric acid, ā ʒss to ʒj.
Sugar, ℥j.
Water, ℥xv.

Mix, and give half a tumbler every three or four hours. The diet should be similar to that recommended for typhus fever, but the proportion of wine required is seldom so large when the bowels are much confined, and claret may be substituted with advantage for port. It may be given with water, or mixed with an equal quantity of soda-water. Sometimes sherry is preferred, and then it also may be mixed with either of the above. If the tongue is dry, and the abdomen is swollen and drum-like, wine must be given with great caution, and it will be found that mild animal broths, such as weak beef-tea, or chicken-broth, will be of more service in supporting the strength, while they do not aggravate the irritability of the stomach. Milk and soda-water (see page 248) may also be tried, and injections of gruel, containing half an ounce of spirit of turpentine, with an equal quantity of castor-oil, may be used with advantage. The common turpentine liniment (page 237), may also be freely rubbed into the skin of the abdomen night and morning. The recumbent position should be strictly maintained throughout the attack; but when the remission is well marked, and there is considerable restlessness, a dressing-gown may be put on at these periods, and the patient may be allowed to move about on the bed or sofa, so long as the erect position is not attempted.

1163. THE USE OF THE HYDROPATHIC COMPRESS is very beneficial in this form of fever, but it is not adapted to any but slight attacks, as in more severe ones there is great doubt of the powers of the system being equal to produce reaction.

1164. HEMORRHAGE from the bowels is a very common complication, and is generally a very dangerous symptom, as, in the first place, the remedies which have power to control it are in themselves more or less injurious, and in the second, it is frequently connected with ulceration of the bowels. The astringent mixtures, given at page 345, are the only safe remedies in ordinary hands; but the acetate of lead is sometimes given, and has greater power than either of them. Nevertheless, as it is a most dangerous remedy if carelessly used, I cannot recommend its adoption.

1165. As this disease, when it prevails in any district, appears to be due to epidemic influences rather than to contagion, there is no necessity for the use of the chlorides to prevent that result; but as they appear to exercise an influence over *malaria*, as well as over the *fomites* of contagion, one or other should be used in the sick-room or passages adjoining.

1166. YELLOW FEVER (page 82) is never known to occur in this country, and I have not, therefore, seen an example of it; but for the convenience of those who may chance to meet with it away from medical help, a short account of the treatment usually practised is subjoined.

(*a*) *The indications* are—1st, to produce a rapid effect on the liver and whole system by mercury to the extent of salivation; 2nd, to carry off the bile from the bowels by aperients as fast as it is poured into them from the liver; and 3rd, to palliate other concomitants by such remedies as are deemed essential, but not lowering the system more than is absolutely necessary to prevent disorganisation.

(*b*) In order to carry out these views in practice, it is well to begin with a powerful emetic which for a time relieves the congestion of the liver, in which the essence of the disease appears to consist. The best emetic for the purpose is said to be the sulphate of zinc, in the dose of twenty to thirty grains dissolved in water. As soon as this has done acting, calomel must be given in large doses, viz., five, ten, or even twenty grains every two or three hours, until the gums are affected; at the same time rubbing into the side, and to the inside of the thighs, as well as into the arm-pit, large quantities of mercurial ointment.

(*c*) As the bowels are generally obstinately confined, it is the practice to give croton-oil with the calomel, and for this purpose one or two drops are given in a pill an hour after the first dose of calomel, and repeated every three or four hours until the bowels are freely relieved. An enema of an ounce of spirit of turpentine, an ounce and a half of castor-oil, and two pints of gruel, may also be used, in order to assist the action of the purgative.

(*d*) If the skin is very hot, cold ablution may be practised; or if, on the contrary, there is a cold clammy skin, a hot bath, at 120° F., or even higher, will be serviceable.

(*e*) If there are local congestions, as in typhus fever, the loss of blood by leeches or cupping should be had recourse to, followed by a blister.

(*f*) *Hemorrhage* often occurs, and if so, it should be met in the same way as in the English remittent (par. 1164).

(*g*) If there is great collapse or exhaustion, ammonia, wine, or brandy, will be necessarily employed, as in typhus (see par. 1159 *c*).

(*h*) With regard to food in the early stage, while the danger is imminent, the less that is given the better, as the stomach is not in a condition to digest it, and it therefore only irritates its lining membrane. When, however, the first urgent symptoms are abated, the most nourishing form of diet must be used, such as all kinds of farinaceous articles, animal broths, and jellies, and other similar dishes. In fact, the treatment as to these adjuncts is exactly the same as in typhus fever.

1167. THE TREATMENT OF INFANTILE REMITTENT is given at page 298.

SECT. 3.—TREATMENT OF HECTIC FEVER.

1168. As this fever is always symptomatic of some local inflammation, or of extensive purulent discharge, the treatment must be such as is required for the cause which has produced it. At the same time, the colliquative sweats and diarrhœa which are peculiar to it may be relieved by the use of astringents (see page 345)

CHAP. VI.

TREATMENT OF ERUPTIVE FEVERS.

SECT. 1.—SMALL-POX.

1169. IN THE TREATMENT OF SMALL-POX (page 31) so much depends upon the nature of the particular attack, viz., whether *confluent*, or *distinct*, or *modified*, that each of them must be alluded to separately. It is, of course, to be assumed that inoculated small-pox is out of the question, as the operation is now contrary to law.

(*a*) *In confluent small-pox* (page 92) it must be remembered that (as in the case of typhus) the patient will have to go through a most exhausting stage, and therefore the strength should be husbanded as far as circumstances will admit. It must also be borne in mind that the fever is a natural effort to throw off the poison, which is here done through the skin, and, consequently, no attempt should be made to reduce its force, unless there is reason to believe that it is so high as in itself to lead to dangerous results. On the first onset of the disease, that is to say, *during the period of incubation*, salines in a state of effervescence are useful, as in all inflammatory fevers, and may be adopted here with advantage; the bowels, also, should be attended to, and should be *gently* moved, but violent purgation is very injurious. If the fever is not accompanied by intense throbbing of the arteries and violent headache, and if, also, there is no congestion of the brain or lungs, matters may be suffered to take their course, with the above exceptions. But if in a plethoric subject there is a very strong, quick, and hard pulse, with threatened congestion of the brain or lungs, blood should at once be taken from the arm, and this remedy may also be adopted when the pain at the pit of the stomach, which accompanies the early vomiting peculiar to this disease, is unusually severe. If these symptoms are not so violent as to warrant a general bleeding, a few leeches to the temples, chest, or pit of the stomach may be used instead, but in no case should blood be taken without real necessity, and unless the system is overloaded with it. In lieu of bleeding, if there is congestion or inflammation of the brain or lungs, tartar-emetic should be given in half-grain doses, unless it purges, when it must be discontinued, and ipecacuanha substituted for it. *During the time of maturation*, if the eruption does not come out freely, the feet may be placed in hot water up to the knees, and if the pain at the stomach and vomiting continue, a blister may be applied to the pit of the stomach. The throat is often full and painful, and this may be relieved by hot fomentations, externally applied. Castor-oil is the best aperient, if any should be required, and the dose should not be greater than sufficient to procure a single evacuation. The cooling mixture given below may now be administered with advantage, as it aids the appearance of the eruption, and also acts gently on the skin. If in this stage there is congestion of the lungs or brain, with a slow appearance of the eruption, and especially if the skin looks blue, an emetic of ipecacuanha will be of service, followed by nauseating doses, united with the diaphoretic mixture. Any complication, either in the brain, lungs, eyes, or other part must at once be attended to, and relieved by local measures. Lastly, in the *period of decline*, little more is to be done than still to keep the bowels gently moved, and if there is great prostration of strength, especially if there are typhoid symptoms, it must be supported by bark, port-wine, brandy, ammonia, and beef-tea, &c., exactly as in typhus itself. The matter as it escapes from the pustules may be absorbed by starch-powder, or by common flour, which prevents its irritating any sound portions of skin that may be exposed. If erythema or erysipelas make their appearance, no local application is better than the above, dredged on with a common "dredger," and used repeatedly in the day, with an occasional fomentation of hot water. They are signs of great debility in this disease, and almost always require bark and wine, unless they make their appearance very early in the attack. Abscesses are very apt to form at this time, especially in the scalp, and great caution should be used lest the matter should spread extensively from a want of being let out by the lancet, which operation should be practised as soon as it is discovered. The following is a list of the formulas which have been alluded to above:—

For the Diaphoretic Mixture—

Take of Solution of acetate of ammonia, ℥j.
Spirit of nitric ether, ʒiij.
Nitrate of potass, ʒj.
Wine of ipecacuanha, ʒj to ʒiss.
Camphor mixture, ℥viss.
Mix, and give two table-spoonfuls every four hours.

For the Emetic—

Take of powdered ipecacuanha, gr. xx to xxv.

(*b*) *In distinct small-pox* the symptoms are generally much less violent, and seldom require anything more in the shape of medicine than the common effervescing draughts (page 342) with castor-oil, and sometimes the diaphoretic prescribed in the last paragraph, when the eruption is slow in making its appearance. Occasionally, however, even in this form of small-pox the local congestions are severe, and require the same remedies as are alluded to in the last paragraph. Generally the secondary fever is very trivial, and there is not often any necessity for bark or stimulants.

(*c*) *Modified small-pox* has usually such mild attendant symptoms that little or no treatment is required beyond rest in bed, with plenty of fresh air, and the use of gentle aperients, low diet, and perhaps the common effervescent, or any mild and ordinary diaphoretic, or diuretic if the kidneys do not act.

(*d*) In all cases of small-pox there should be an abundant admission of fresh air; but as there is strong reason for believing that the pustules are not so fully developed in the dark as in a strong light, provision should as far as possible be made for the exclusion of the latter, so long as air is not also prevented from circulating freely. Chloride of lime or zinc should also be freely used, both in the room itself and in the adjacent passages, and every precaution should be taken to prevent the spreading of the disease. (See *Contagion.*)

(*e*) In order to prevent the occurrence of pitting, the pustules on the face may be pricked on the eighth day, and their contents at once absorbed by carded cotton, or by soft old muslin as fast as they exude. It is a tedious process, however, and will occupy some hours; but as in this way the disfigurement of the features is almost entirely prevented, there are few patients who have not some kind friend ready to undertake the loathsome task.

1170. Cow-pox being almost always produced artificially in the child, the treatment of it and the mode of vaccination are already given at pages 267 and 300.

Sect. 2. — Chicken-pox, Measles, and Scarlet Fever in the Adult.

1171. Chicken-pox, Measles, and Scarlet Fever, although occasionally attacking the adult, are generally passed through in childhood, and their treatment has, therefore, been included among the diseases of childhood at pages 300 to 301. If, however, they occur in after-life, the treatment must be conducted on the same principles, remembering always that the tendency to congestion in the brain, lungs, and bowels, is increased at that age, and especially in the first-named organ. In measles this is particularly the case, and this usually mild disease becomes occasionally converted into a most formidable one, from the head-complication, which sometimes requires very vigorous measures to prevent fatal mischief. The following extra precautions may therefore be taken:—

(*a*) *In adult measles*, until the eruption is fully out, great care should be taken to avoid the slightest chill by exposure to cold, while the same precaution is afterwards necessary to avoid "striking it inwards," with the consequent internal congestion which is almost sure to occur. Putting the feet in very hot water will often help to bring out the eruption, but unfortunately the existence of the disease is not often recognized until the stage of eruption is already arrived at, for the watering of the eyes and running at the nose are frequently mistaken for a "common cold." If, however, there is the probability of the patient exhibiting these symptoms having been infected, it is always prudent to adopt the above remedy in order to favour the eruption, and especially as it is also beneficial to the simple catarrh, if such is the nature of the affection. In other respects, the treatment recommended at page 300 may be adopted, the doses of the medicines only requiring a slight increase.

(*b*) *Scarlet Fever* in the adult varies little, if at all, from the corresponding disease in childhood; and it is probably not more fatal at a maturer age than before puberty. It may, therefore, be treated exactly on the principles laid down at page 301.

SECT. 3.—TREATMENT OF PLAGUE.

1172. PLAGUE, like yellow fever, is unknown in this country; nevertheless, for the reasons given at page 359, an account of the usual treatment adopted in the East, is here appended. The symptoms are described at page 40.

1173. IN THE TREATMENT OF PLAGUE it is now generally believed that medicine is almost wholly inoperative, the chief art consisting in properly maturing the buboes by warm poultices of linseed-meal. Sometimes an emetic has been found to relieve the internal congestion, which is so prevalent in this horrible disease, and, for this purpose, the sulphate of zinc, as ordered at page 359, will be found to be the best. Blood-letting in plethoric subjects, and stimulants in feeble ones, must be had recourse to; and, on the whole, the principles laid down at page 352, as adapted for typhus fever, may be considered to be applicable in plague. Mercury is said to be as serviceable as in yellow fever; but its utility is not so generally recognised as to warrant its being recommended as of any real advantage over the simple natural powers.

SECT. 4.—TREATMENT OF MILIARY FEVER.

1174. The management of this febrile affection (described at page 40) will greatly depend upon the precise nature of the attack, whether dependent upon contagious or epidemic influence, or produced, as it often is, by the adoption and long-continued use of diaphoretics, and heavy bed-clothes. In the former case very little treatment will be required, as the disease will generally abate as soon as it has run its course; but when the cause is connected with mismanagement of the skin, it is necessary that a change should take place in that respect, and that part of the bed-clothes should be cautiously removed, the air of the room being also lowered by degrees, and all diaphoretic medicines withdrawn. It is even wise sometimes to expose the arms and chest to the air occasionally, taking care to prevent a chill, by not continuing it for more than a few minutes. In addition to these gentle remedies, which merely remove the previous mischievous agents that have caused the eruption, it may sometimes be necessary to give a gentle aperient, and, for this purpose, nothing answers better than the combination of Epsom salts with cream of tartar, which may be given every morning, and the diluted sulphuric acid will perhaps aid in accelerating the cure; but it is seldom desirable to give it, except as the ordinary drink as directed at page 353.

1175. Sometimes in this disease, after the eruption has shown itself partially, it suddenly disappears, and there is then a profuse sweat, with great exhaustion, difficulty of breathing, yawning, or sighing, and even, in some cases, convulsions or delirium. Here, ammonia and the compound tincture of camphor will often be found very serviceable in the form prescribed below, while the skin should be freely rubbed, or fomented with hot flannels. It is sometimes so alarming a state as to demand the most careful superintendence.

Take of Carbonate of ammonia, gr. xl.
Compound tincture of camphor, ʒj.
Spirit of nitric ether, ʒiij.
Camphor mixture, ℥viss.
Mix, and give two table-spoonfuls every three or four hours.

CHAP. VII.

TREATMENT OF CONGESTION, INFLAMMATION, AND INFLAMMATORY FEVER.

Sect. 1.—Congestion.

1176. Although by *post mortem* examination and other modes of investigation, the existence of congestion, both in its active and passive forms, has been fully established, and the appropriate treatment has been laid down, yet there is often, still, great difficulty in distinguishing the exact condition of the part, and, as a consequence, in adapting the means for its removal. It is easy enough to say *afterwards* that the disease has only been of a congestive character, because there is no alteration of structure, or change of function; but by that time the necessity and time for treatment have gone by, and the diagnosis is quite useless. Nevertheless, there are some circumstances which induce us to believe that the local affection is congestive rather than inflammatory—as, for instance, when there is evidently pain and a dull red or purplish colour of the skin, with slight swelling, and increase of heat; while, at the same time, there is not much fever, and a low state of arterial action, or, at all events, not a pulse to indicate inflammation. It is rather by the absence of the signs of inflammation than by the presence of any peculiar to itself, that we recognise the change called congestion, and with this limited power we must content ourselves, and act up to the light which we can obtain.

1177. But supposing that we have come to the conclusion that an ACTIVE CONGESTION exists in the vessels of any part, the treatment required will be chiefly to moderate the action of the heart, either by medicines which act specifically on it, such as hydrocyanic acid, or tartar-emetic, or digitalis; or, on the other hand, when there is time sufficient for the purpose, to cut off the supplies to the blood, by diminishing the quantity, and lowering the quality, of food. Yet there are cases in which this active congestion appears to occur from a deficiency of power or tone in the system, rather than the reverse, and where the above plan is not only useless but actually prejudicial; such are those called "irritation" by some observers, and apt to occur in the final stages of fever, either of the ordinary kinds, or especially in that known as hectic fever. These, however, are wholly exceptional, and are probably only considered to be congestive from a want of more perfect knowledge on the subject. With these general measures must be combined such local remedies as will soothe the nerves of the part, such as cold lotions externally, or, in active congestions of internal organs, such medicines as are found to have the desired effect, which will be detailed under the respective chapters devoted to the several parts of the body.

1178. In Passive Congestion, there

may be general plethora, or the reverse; but in all cases the part attacked is overloaded with blood, from a deficiency of action in the vessels, which are enlarged in their calibre, and circulate their blood more slowly than usual. In external congestion of this kind, relief is often afforded, either by hot or cold applications, the former relaxing the vessels and enlarging their diameters, by which the passage of the blood is accelerated; while the latter go to the root of the mischief, and stimulate the nerves to a healthy degree, so as to cause the blood-vessels to recover their tone, and thus strike at the cause of the disease. Hence the good effect of cold, *if successful*, is more speedy than that of hot applications, but the remedy is much more doubtful, because it often fails to act sufficiently on the nerves, and then, as it also tends to diminish the calibre of the vessels, without at the same time giving them their natural power of propelling the blood, the congestion is increased in degree. It is, therefore, only in the early stage of passive congestion, and especially in superficial or limited attacks, that it can be reckoned on, and it should not be otherwise employed. Pressure will often relieve this form of congestion, not only by tending to empty the vessels, but from the stimulus which it gives to the nerves; and in the same way a medicinal stimulus will often relieve congestion, either when locally applied or when given internally, in the case of those drugs which have a specific and local effect. Nothing seems to relieve congestions of the chest and abdomen like an emetic, which has the double advantage of reducing the action of the heart for the time, while the contractions of the abdominal muscles in the act of vomiting are mechanically pressing out the blood from the congested organs. Nausea reduces the action of the heart, and thus tends to afford relief, but it has not the mechanical effect attending upon full vomiting.

1179. It will thus appear that very opposite treatment must be adopted in the various stages of congestion, and that we have to choose very often between lowering and supporting remedies, and between the use of hot and cold externally. It is even required, in many cases, to blow hot and cold at the same time, or in a rapidly succeeding order, so that the abstraction of blood, or the use of an emetic, may be necessary to the safety of a patient, and yet immediately afterwards brandy, or ammonia, or both, may be required to afford that stimulus which alone will enable the vessels to recover their healthy tone. Altogether the subject is one which requires the deepest study, and which tries the tact and experience of the physician to the utmost degree. It is, therefore, scarcely to be expected that the domestic observer should be able to master the full details of the treatment of congestion in all its several phases; but, nevertheless, these remarks have been inserted in order to serve as some slight indication of what is *to be avoided*, should the necessity for the treatment of any attack of congestion be thrust upon any of my readers.

SECT. 2.—INFLAMMATION.

1180. Inasmuch as this process is attended with a stoppage of the flow of blood through the affected part, however produced, and as this is clearly beyond the powers of the heart to overcome it, or it would be overcome; so it is necessary that two indications should be attended to in treating this disease in almost all cases in which it occurs. Every one must have seen a flock of sheep driven through a narrow passage; how this is effected by the skilful drover by inducing the leading sheep by some means to pass through, while the unpractised person would crowd them all up into a heap, and prevent any one from moving by the force which is exerted upon all. So it is with the blood when retarded by the impediments caused by the existence of inflammation: here it is necessary, in the first place, to prevent the overcrowding from behind; and for this purpose the action of the heart must be reduced, either by bleeding, or by some lowering remedy, such as tartar-emetic, calomel, or digitalis. As soon as this is effected, the blood in the minute vessels may be coaxed on by acting on them either by some local stimulus applied to the nerves, or by a special internal agent of the same kind, or by leaving nature to do her work without further assistance than that already mentioned. In inflammation of the most simple kind, occurring from an accident in a healthy subject, it is only necessary to take care that the heart and arteries do not act too much, and then nature will do her part, and the inflammation will not go beyond the point set up by her for the repair of the injury. But in addition to these remedies intended to act both upon the power of the heart, and upon the small arteries, there is also the diseased change in the blood itself, which must be altered to a healthy state before the mischief is entirely got rid of. Thus, it is stated at paragraph 122, that "in the blood, as the necessary precursor of any extensive inflammation, there is always found an increased quantity of fibrine," and, therefore, until this excess of that material is removed, the tendency to inflammation still continues; and as the disease itself was described at page 42, as consisting in—1st, a peculiar state of the blood; and 2nd, a lower vitality in the part which is to be the seat of the disease, while its essence consists in a change of the function of that part—so the *indications* for *treatment* are, 1st, to remove the excess of fibrine; and 2nd, to restore the depressed vitality in the part, which can only be done in the way men-mentioned above; that is to say, by reducing the action of the heart at the same time that the nerves of the small vessels are stimulated by appropriate remedies.

1181. But independently of the principles of treatment which are applicable to inflammation as a general rule, there are others also which must be adopted in order to obviate those results of the altered function of the part affected, which are injurious to the safety of the organ. Thus, when lymph is deposited in the substance of an organ, which is one of the most common effects of inflammation, some means for its re-absorption into the blood must be attempted and carried out, unless it is believed that nature will, by her own unaided efforts, accomplish the task. So also, in effusion of serum into the serous membranes, or of matter either into them, or into new cavities formed in the cellular membrane, as in the case of abscesses, certain remedies applicable to each state must be adopted, and which are as various as those states themselves.

1182. The whole list of remedies which are useful in all the forms and stages of inflammation would occupy too much space to be inserted here; but the following are those which are chiefly serviceable in its domestic treatment.

(*a*) *In lowering the action of the heart, which is only necessary in acute inflammations*, bleeding, tartar-emetic, calomel, especially when united with opium, digitalis, hydrocyanic acid, and starvation are employed. Bleeding, it must be remembered, has only a temporary effect, because, though nothing lowers the power of the heart so rapidly, yet this is always followed by reaction, unless stopped by cutting off the supplies, and by the use of some additional remedy, such as one of those mentioned above. Tartar-emetic is the most active of these, and there is no doubt that by its means a state of the most complete prostration may be kept up for any moderate length of time, though not without some danger of its going too far. Calomel has also great power, but more by its action on the secretions, than directly upon the heart itself. On the other hand, digitalis and hydrocyanic acid depress the heart to any extent; but they do not exercise their power, except in doses which are scarcely safe in domestic practice.

(*b*) *In carrying out the second indication* (namely, that of stimulating to contraction the dilated small vessels by the action of certain remedies on their nerves), it is found that there are not only local means, such as cold, pressure, astringents, &c., as in external inflammations, but there are also certain remedies which act specifically upon the small vessels, such as arsenic, antimony, the various salts of mercury, and iodine; and, in addition, certain balsamic or gummy substances, which exert a peculiar effect upon the mucous membranes, such as copaiba, turpentine, benzoin, ammoniacum, &c. In selecting the appropriate remedy, we must for the most part act empirically, that is to say, we must be guided by experience of the effects of each in former cases. Thus, although we know that tartar-emetic has a much greater effect than any other remedy, if used indiscriminately upon a mass of cases of inflammation of various kinds; yet there are numberless instances in which mercury, arsenic, or iodine, would be preferred, because experience tells us that each has its appropriate office, in reducing by some specific power some particular kind of inflammation. Many of these active agents in reducing inflammation (antiphlogistics, see page 342) are capable of producing it, if applied to the skin in large doses, and thus afford examples of the rule "*similia similibus curantur*," so much relied upon by the homœopaths, and alluded to at page 186, as one of those which form the code of the orthodox practitioner. Thus, tartar-emetic rubbed into the skin produces an eruption resembling small-pox, mercury is followed by erythema, while arsenic will even produce gangrene, if used in sufficient strength. These are all capable of being absorbed into the blood, and there is therefore every reason to believe that the effect is the same upon the small vessels when applied to their interiors, as it would be, if they were brought into contact with the exterior of the vessels when rubbed into the skin. With regard to the local remedies employed externally, cold (or the abstraction of heat) is certainly the most powerful of all, and it likewise, as in the above case, may be carried to such an extent as to produce inflammation in a sound skin, as in frost-bites, chilblains, &c., so that, probably, if all diseases were of an inflammatory character, Hahneman's rule might pretty generally be found to be true. Next to cold comes the nitrate of silver, which is very generally useful as a stimulating application in many forms of inflammation of the skin, as in erysipelas, herpes, &c.; while after these might be enumerated a long list of remedies, some of which are possessed of extensive virtues, while others are limited to a very small sphere of action. Warm fomentations allay inflammation in a totally different way to cold, and also to those other remedies which have been alluded to as stimulating the small vessels to contract. Here we have relief afforded by relaxation of the vessels, and consequent more free admission of blood, together with a greater effusion of serum or matter, as the case may be, into the surrounding cellular membrane, which are two of the natural modes of relief to the inflamed vessels. For this reason it is chiefly applicable in those forms of this disease, in which a cure is to be expected only after the establishment of one or other of these secretions, and in which there is no chance of cutting short the inflammation at once by what is called "resolution."

(c) *The reduction of the quantity of fibrine* is, to a certain extent, effected by nearly all the remedies mentioned at (*a*); but arsenic, mercury, and iodine have by far the greatest power in producing this effect, and it is to this particular action that their utility in chronic inflammations is chiefly to be attributed, though there is no doubt that they also act upon the small vessels by procuring their contraction, as explained at (*b*). *How* they procure this elimination of fibrine, it is not so easy to explain, but of the fact, there is no doubt, from the result of innumerable experiments. Bleeding acts still more energetically and rapidly, because it removes a certain portion of the whole mass of the blood, including the fibrine; after which it is found that the bulk is made up by the addition of watery serum, containing a very small proportion of fibrine; and, therefore, the whole quantity of blood soon becomes impoverished in that respect. But there is reason to believe that this remedy has in the end a prejudicial effect, inasmuch as the whole quantity of fibrine lost is soon made up, and this is followed by an extra supply, which does not cease until the result is that the blood is in a worse condition than before. Unless, therefore, bleeding is followed up by the exhibition of one or other of these remedies, or by a rigid abstinence from the usual quantity of food containing fibrine, or fibrine-making materials, it will ultimately do great harm in all cases of inflammation, and will tend to bring on subsequent attacks, although it relieved the first, and will again have the same effect in removing any which it may have brought on. It is a most false and flattering remedy, always giving instant relief, yet tending to future aggravation of the very essence of the disease, and for this reason it has been wofully abused, until its objectionable nature was discovered. Still, it is sometimes the only remedy in active inflammation which will act rapidly enough to meet the exigency of the case, but when there is time to look for a substitute, there is seldom any excuse for its employment.

SECT. 3.—TREATMENT OF VARIOUS EFFECTS OF INFLAMMATION.

1183. THE VARIOUS EFFECTS of inflammation have been enumerated and described at pages 42 and 43, as comprising the following—viz., 1st, resolution; 2nd, a deposit of lymph, which may either end in adhesion or induration; 3rd, the formation of matter; 4th, gangrene, to which are added, by most writers, the increased flow of the secretions from the serous and mucous membranes, though, as observed at page 40, these are more strictly to be referred to the condition known as active congestion.

(*a*) *Resolution* being merely the change from a state of diseased relaxation of the small vessels to one of health, is promoted by all such remedies as act at once upon them, without having recourse to the more tedious processes, which consist in the formation or deposit of lymph, pus, blood, &c. Hence, large bleedings, either general or local, the application of cold, tartar-emetic, calomel, and other remedies which act rapidly upon the small vessels themselves, possess this power. Arnica montana also seems to act locally in this way, and, probably, also when taken into the system through absorption from the stomach. Counter-irritation may also be mentioned as a powerful means of effecting resolution. (See pages 187 and 261.)

(*b*) *Deposits of Lymph*, when made for the purpose of uniting surfaces which have been separated by accident or operation, become ultimately organised, and it is not therefore desirable to promote their absorption or removal. But when this substance has been thrown out from the small blood-vessels in inflammation, and deposited within the meshes of the cellular membrane, producing an induration of its texture, it is highly necessary to obtain the re-absorption of its material into the blood, so soon as that fluid has been placed in a condition to receive it without injury. Of course this cannot take place until the extra per-centage of fibrine in it has been removed by nature or art; but as soon as this has been effected, if the body is tolerably healthy, nature sets about her task, and the re-absorption takes place in a slow but steady manner. Thus we find, after any phlegmonous inflammation of the skin, the hard swelling gradually disappears, and the texture ultimately becomes as soft and yielding as ever, the only change being that the lymph deposited in it has been removed.

(*c*) *Matter*, when deposited in some situations, has no other chance of being removed but by re-absorption, in the same way as has been described with regard to lymph, and here, though slowly and reluctantly, yet still, in course of time, in tolerably healthy subjects, the process is effected. But, in other cases, nature establishes a peculiar method of cure, by which she effects the removal of the matter from the situation where it was deposited. This is managed by first limiting the matter to a circumscribed cavity, formed by walls of lymph around it, and constituting what is called an abscess. Next, the materials, whatever they may be, between this collection and the surface of the body, or between it and some mucous surface internally existing, are gradually removed by absorption into the blood, so that at last an opening is made, by which the matter escapes altogether from the body, and the cavity is filled up—for which purpose a large supply of fibrine is required, which further aids in removing that substance from the whole mass of blood (see par. 125). But, in order that this change in the situation of an abscess should take place, the system must not be lowered too much, or the small vessels will not have power to effect the purpose, and hence it is that in debilitated or in scrofulous subjects, collections of matter often remain for months without coming to the surface. This must, therefore, be taken into consideration in the management of collections of matter, and a due balance must be struck between the amount of lowering, which is needful to keep down the fever which accompanies the formation of matter, and the degree of power which must be reserved to effect its removal from the system, and the filling up of the cavity which contained it, by the vital process above described. The rule, not to reduce the powers of the system more than necessary, since they are sure to be required in the after-removal, should be strictly carried out in all attacks of inflammation where matter is likely to be formed, and especially where the quantity of it is large. The local remedies which assist the formation of matter, and the absorption of the parts between it and the surface, are chiefly warmth and moisture, which act by encouraging the flow of blood, and the deposit of lymph, as well as the absorption of the parts required for its coming to the surface. This encouragement of the gradual absorption is commonly called "drawing," but it is no more than an aiding of the actions established by nature herself. There is another main feature and advantage in these warm and moist applications, and that is their soothing effect upon the nerves, by which pain is relieved very considerably. They comprise fomentations of hot water, warm-baths, either general or local, and poultices, which are described at page 263, and which last are the remedies most generally available for the purpose. Granulation, which is a still further stage in remedying the effects of inflammation (see page 43), must be aided by stimulants, both general and local, and by good nourishing diet, if the granulating surface is a large one, or the quantity of fibrine required will not be afforded by the blood. Hence it often happens that so long as an abscess is dormant, the health and strength are capable of bearing up; but the moment that there is a call for granulation, in order to fill up the cavity left when the matter is removed, the demand on the system is of such a nature as to occasion hectic fever, and even death, if the system cannot be supported by proper nourishment.

(*d*) *Gangrene*, being the death of a part of the body, if left to the unaided powers of nature, calls for an immense expenditure of her resources in order to effect a separation of the dead from the living, which is effected by an absorption of a thin layer of the latter where it joins the dead surface. Hence there is a great necessity for supporting the strength, in every possible way, by means of nourishing food, and by giving such medical substances as will strengthen the digestion, and at the same time give power and tone to the absorbing vessels at work on the parts adjacent to the dead mass (or slough as it is called). Bark, port wine, and rich animal foods, are the chief general remedies, while warm poultices, of such a nature as to stimulate the absorbing vessels, are the local applicatiions likely to be serviceable.

(*e*) *In relieving* the effects produced by excessive discharges of serum and mucus, the indications are to moderate them, as far as is consistent with the diminution of the congestion or inflammation; but it is often found that it is impracticable to do this without increasing this condition of the vessels, and in that case it is better to allow of the secretion going on, within due bounds, than to attempt to do more harm than good by checking the flow. This is especially manifest in bronchial discharges of mucus where the mischief arises chiefly from the impediment to the flow of blood through the lungs, and not from the amount of mucus secreted. In such a case, therefore, as the secretion of the mucus is the main and natural means of relieving the congested or inflamed vessels by emptying them of part of their contents, the encouragement of the flow of mucus is the main object of medical art, and hence the remedies called expectorants are so useful in this affection. Sometimes, however, astringents are to be applied, inasmuch as the state of the vessels is such as to bear remedies of this nature, which act by causing contraction of their canals, and consequent diminution of their secretions.

(*f*) *The specific remedies* necessary for each kind and sort of inflammation will be described under the various chapters treating of them respectively.

SECT. 4.—TREATMENT OF THE SYMPATHETIC FEVER ACCOMPANYING INFLAMMATION.

1184. THE TREATMENT OF THE CONSTITUTIONAL SYMPTOMS accompanying the various inflammations (described at page 44) is really that proper for the several inflammations themselves, as far as the general remedies are concerned. It is, therefore, unnecessary to allude to it further, as it has already been described in the last section.

CHAP. VIII.

GENERAL PRINCIPLES OF TREATMENT OF THE INFLAMMATIONS OF THE MUCOUS MEMBRANE AND SKIN.

1185. As the structure and functions of these two systems have been shown to be very similar, at pages 45 and 46, so it will appear that the treatment necessary for relief of their several congestive and inflammatory diseased conditions is to be conducted on nearly the same principles. It has been already remarked at par. 1183, that inflamed or congested mucous membrane is sometimes relieved by stimulants, which increase the mucous secretion, and at others by astringents, which check it; while they at the same time cause contraction of the small vessels. So, in like manner, in the corresponding conditions of the skin, cold and bracing applications will serve the purpose in some kinds of inflammation, while others are only aggravated by them, and require soothing and relaxing, rather than the reverse. Thus, in some stages of erysipelas, a cold evaporating lotion will be of service, and will at once cut short the disease, as is also generally the effect of nitrate of silver, applied in solution; but in other attacks of the same disease, cold is highly prejudicial, and even nitrate of silver will fail in producing its specific effect. So also in certain watery eruptions (herpes and eczema), it is useless to attempt to restrain the discharge by astringents, and the only successful mode is to apply soothing remedies externally, while the blood is acted on by means of those remedies, which alter its component parts—viz., arsenic, iodine, &c. In another respect also, the two sorts of inflammation are to be treated alike, namely, to a certain extent, disregarding the constitutional symptoms which accompany these inflammations, inasmuch as the diseases themselves are seldom so severe as to lead to a dangerous result; while in serous inflammations, and those of the brain and of the cellular structure of the lungs (pneumonia), the danger is imminent, if the course of the disease is not at once arrested. For this reason, the progress of inflammation of the mucous membrane and of the skin may be allowed in most cases to take its natural course, and the cure, by the discharge of fluid from the vessels, may be permitted to take place. To this, however, there are certain exceptions, as in the case of croup, cholera, and severe diarrhœa, or dysentery, with reference to the mucous membranes, and in that of erysipelas in the skin.

SECT. 2.—EFFECTS OF INFLAMMATION ON THE MUCOUS MEMBRANE AND SKIN.

1186. It must be observed as of practical importance, that in most instances the discharges, by means of which the inflammation of these surfaces is so often relieved, are at once carried off without difficulty, so that there is no necessity for artificial assistance. There are, however, some exceptions, as in the case of croup, where the fibrinous cast lining the trachea will cause suffocation, if allowed to collect there and to remain undisturbed, whereas by the free use of emetics it may be loosened and removed. Here, however, the indication is more to prevent its formation than to cause its removal, and it can hardly be considered an exception to the rule.

1187. THE REMEDIES applicable to congestions and inflammation of the *mucous membranes*, are tartar-emetic, ipecacuanha and opium, the balsams and stimulating gums, and the various astringents, as well as in some cases demulcents, such as chalk, gum-acacia, linseed tea, &c. For the *skin*, soothing local remedies are sometimes applicable, such as warm fomentations and poultices; and at others, the use of cold, or nitrate of silver, or chloride of zinc, and other similar metallic salts, which contract the small vessels and check inflammation at once. Arsenic and iodine are here the chief internal remedies which are indicated, but there are some others of limited value, such as pitch, sulphur, &c. In both sets of diseases the remedies are selected almost entirely of empirical principles, which even here will be found to be a better practical guide than that adopted by homœopaths, although the latter will serve in this department of medicine more nearly than in any other.

CHAP. IX.

TREATMENT OF THE SPECIAL INFLAMMATIONS OF MUCOUS SURFACES.

SECT 1.—TREATMENT OF CATARRH AND INFLUENZA.

1188. COMMON CATARRH (page 47) is generally best left to the powers of nature, which will in good time effect a cure, by means of the discharge from the mucous membrane, whether that be of the nose or the bladder. One method of treatment is very efficacious, though exceedingly difficult to carry out, consisting in the entire abstinence from all liquids, which in forty-eight hours will cut short any ordinary catarrh; but few people have courage to carry out their resolutions, and have not self-denial sufficient to abstain, when the feeling of thirst becomes excessive, as it does after twenty-four hours, or sometimes in much less time. Nothing short of total abstinence is of the slightest use, and half-measures certainly will not be found to mitigate a catarrh at all. Action on the skin by means of the warm-bath or the vapour-bath, or by the hydropathic processes described at page 206, will have the effect of relieving the general feverishness, and also the local discharge; but they do not cut short the disease altogether, and can only be considered as palliatives. Putting the feet in very hot water, and keeping up the temperature as high as it can possibly be borne, is a popular and very excellent remedy, as also is the hip-bath when the bladder is affected. The vapour and warm baths are also very useful, but they cause considerable weakness, and tend to make the skin very susceptible of fresh cold. On the other hand, the "packing" has no such prejudicial effect, being followed by the bracing application of cold water, which gives fresh tone to the skin rather than the contrary. Where there is more fever than usual, small doses of tartar-emetic may be combined with diaphoretics, and will afford considerable relief; or a diaphoretic may be given alone at night, according to the following formulas:—

Take of Tartar-emetic, gr. j.
Spirit of nitric ether, ʒiij.
Compound tincture of camphor, ℥j.
Solution of acetate of ammonia, ℥j.
Camphor mixture, ℥vss.
Mix, and give two table-spoonfuls three times a day;

Or, take of—
Compound ipecacuanha powder, gr. x.
Syrup, sufficient to make into three pills.
All of which are to be taken at night;

Or, give a basin of white wine whey, made and used as directed at page 249.

1189. INFLUENZA (page 47) is to be treated in its early stages like catarrh (see last par.); but when the exhaustion or prostration is great, which is the peculiar characteristic of the disease, more stimulating remedies must be employed—such as the following:—

Take of Sal volatile, min. xxx to l.
Spirit of nitric ether, min. xx.
Compound tincture of camphor, min. xxx.
Camphor mixture, ℥j.
Mix, and give as a draught two or three times a day. As soon as the tongue becomes at all moist and clean, quinine may be given, in order to give tone to the stomach, and enable it to digest food. The bowels must be carefully attended to, but, if possible, the use of calomel should be avoided. Rhubarb and ipecacuanha are the best aperients, and they may be given, if necessary, throughout the attack in the doses mentioned at page 347. But, in spite of the most judicious management, the weakness is excessive; and there is little chance of a full recovery in less than three or four weeks, or often double that time. When there is much acute or chronic bronchitis, both of which form essential features of the disease, they must be treated according to the directions laid down in the next section.

SECT. 2.—LARYNGEAL AND BRONCHIAL INFLAMMATIONS AND CONGESTIONS.

1190. LARYNGITIS (par. 152) may occur as a sequel, or attendant upon, catarrh and influenza; or, it may come on as an original inflammation without previous notice, and attended by only that amount of sympathetic fever which always exists in connection with any kind of inflammation. In either case the kind of *treatment* is the same, being varied in degree, in proportion to the acuteness of the attack. Thus, in very active inflammation of the larynx, the measures taken for relief must be equally powerful, and they must be administered without delay.

(*a*) *In acute laryngitis* (par. 153), it is necessary to bleed from the arm to such an extent as to produce fainting, and sometimes this must be repeated. There is so little time for other remedies to act, before such an amount of effusion takes place as will cause suffocation by blocking up the air-passage, that the loss of blood must be submitted to, and such a quantity must be taken as will produce a decided action, and will last until the other remedies begin to take effect. Of these, the chief is tartar-emetic, which may be given in combination with calomel and opium. The object of the first of these drugs is to lower the heart's action rapidly, and at the same time to prevent effusion; that of the second is to be ready to absorb any lymph or serum which may be poured out; and the third relieves the local irritation, which by causing a cough aggravates the original mischief. The following is the usual formula suited to a severe case in a man of average strength, and which may be modified if the patient is above or below that scale:—

Take of Tartar-emetic, gr. j.
Calomel, gr. xij.
Purified opium, gr. iij.

Confection sufficient to form six pills, one of which is to be given every two, three, or four hours. No speaking should be allowed on any account, the seat of the disease being in the organ of voice. If the danger of suffocation is imminent, an opening may be made into the wind-pipe below the larynx; but this requires a knowledge of anatomy, as there are large and important vessels which can with difficulty be avoided.

(*b*) *After the first stage* of laryngitis, and when effusion has taken place, bleeding and tartar-emetic are useless, and calomel is the only appropriate remedy, together with blisters to the throat. It should be given with opium in half grain doses of each every four hours.

(*c*) *In chronic laryngitis* (par. 154), general bleeding is seldom of use, and even the local abstraction of blood will be of little avail, unless leeches are applied every day, or every other day for six or eight times. Counter-irritation by means of blisters or setons will be the most likely to afford relief, especially in the hands of those who are not competent to push other remedies to the full extent of which they are capable. A blister to the throat is a painful remedy, because, in healing, the skin cracks and causes great torture on every movement of the neck; but it is a most efficacious one, and should therefore be adopted in spite of the annoyance given. The seton is also useful, and altogether perhaps still more so than the blister, as its effects are more permanent, and it can be kept in action with much less difficulty It should be inserted in the skin, which can readily be pinched up below the chin, and a little above "Adam's apple." Small doses of mercury may be given so as to affect the gums very slightly; and the iodide of potassium with sarsaparilla will also generally do good, as there is often a depraved condition of the blood, which this medicine serves to rectify. It is now found that the local application of nitrate of silver by means of a sponge is of the greatest service in this disease; and although it is possible that mischief may be done by using too strong a solution, yet the risk is very trifling; and in a case where medical aid cannot be obtained, I think it would be justifiable for any person of ordinary skill to attempt the use of this powerful remedy. All that is necessary is to fasten a small piece of sponge firmly on a piece of stick nine inches in length, by means of string, but leaving a round, soft mass, the size of a large marble, at the end, so as to conceal the wood altogether, and prevent any injury from its hard point or edge. This sponge is then to be dipped in the solution, and carried quickly over the tongue, and down the throat as far as it will go, pressing it *as much forward* as possible, and not back against the bones of the neck. There is of course a considerable tendency to vomit during this operation; and very often there is a choking or suffocating sensation which lasts for some seconds, being produced by a spasmodic closure of the larynx, in consequence of the irritation of the caustic, but this goes off in a few minutes, after, perhaps, causing no little alarm. My readers must bear in mind, that I only describe this remedy for the use of those who cannot obtain surgical aid. The following are the formulas alluded to:—

Take of The compound pill of chloride of mercury, gr. v.
Extract of henbane, gr. iij.

Divided into two pills, to be taken every night.

Take of Iodide of potassium, gr. xl.
Liquid essence of sarsaparilla, ℥j.
Compound tincture of camphor, ℥ss.
Water, ℥viss.

Mix, and give two table-spoonfuls three times a day.

Take of Nitrate of silver, ʒss to ʒj.
Distilled water, ℥j.

Mix, and form a lotion, to be used daily, or every other day, in the mode mentioned above. If the cough is very troublesome, the following pill may be given:—

Take of Powdered ipecacuanha,
,, opium, ā gr. viij.
,, rhubarb, gr. xij.
Water, or syrup, sufficient to make eight pills.

One of which is to be given at night, or every four or six hours, if necsssary.

1191. **Bronchitis** is either acute or chronic (see page 48).

(*a*) *The treatment of acute bronchitis* (par. 143) will depend very greatly upon the constitution of the individual, and upon the force of the attack. In plethoric subjects, it *may* be necessary to bleed from the arm, but this is very seldom desirable. Leeches to the chest will, however, often afford great relief, out of all proportion to the amount of blood abstracted. Tartar-emetic in violent attacks, and ipecacuanha in mild ones, together with opium, will be found to be the best remedies in the early stage, taking care at the same time to establish a good secretion of bile and urine, by the use of calomel or blue pill, if the liver is in fault, and of mild diuretics, if the kidneys are torpid, the latter remedies being capable of uniting with the ipecacuanha or tartar-emetic. When the first force of the inflammation is broken by the above means, blisters to the chest will be found of great service, or in mild cases, even in the early stage, they may be used; or, instead of them, some irritating liniment may be substituted, using it with the spongio-piline, as described at page 264. The principle upon which relief is to be afforded consists in producing relaxation of the bronchial vessels, and, as a consequence, increasing the secretion of mucus, so as to unload them of part of their contents, by which means their natural powers are likely to be recovered, and the inflammation to subside, that is to say, if the vessels are in a tolerably healthy condition. The *diet* should at first be purely farinaceous, but there is not any necessity for a persistence in low diet as long as in many other inflammatory diseases. When the inflammation becomes of a chronic character, it must be treated as *chronic bronchitis* (see next par.)

Formulas Useful in Acute Bronchitis—

Take of Tartar-emetic, gr. j to ij.
Spirit of nitric ether, ʒiij.
Tincture of henbane, ʒij.
Water, ℥viiss.

Mix, and give two table-spoonfuls every four hours;

Or, take of—
Wine of ipecacuanha, ʒij to ʒiij.
Spirit of nitric ether, ʒiij.
Liquor of acetate of ammonia, ℥j.
Tincture of henbane, ʒij.
Water, ℥vj.

Mix, and give two table-spoonfuls every four hours;

Or, when the kidneys do not act, add to either of the above mixtures—
Nitrate of potass, ʒj.

Take of Liniment of ammonia,
Liniment of turpentine, equal parts,

and rub into the chest, or use with spongio-piline as directed at page 264.

(*b*) *Chronic bronchitis* (par. 144) is benefited by counter-irritation to a much greater extent than the acute form; and repeated blisters, if the strength will bear this drain upon the blood, or if not, irritating liniments or ointments, will be found to be by far the best remedies. If the constitution is sound, chronic bronchitis rarely exists, because, as soon as the acute stage is conquered, nature has power enough to shake off the slight remaining mischief. We may, therefore, assume that there is some radical error in the system; and, when this is the case, the long-continued use of irritating external remedies (which do no harm and some good) is to be preferred, aided by such internal medicines as are found to have a specific bracing effect upon the mucous membrane. Here, however, there is greater difficulty experienced, for the selection is almost always a lottery; and the medicine which will act like a charm in one case will be powerless, or even worse than that, in another. Unfortunately, we know so little of the mode in which these "cough medicines" act, that we can only guess at their probable effect; and we must be content with the guide which blind experience affords. The object here is not, as in acute bronchitis, to afford relief by causing an increase of the discharge of mucus, and thus unload the vessels; but, on the contrary, it is to stimulate them to contraction, by means which will have that effect, aided by derivates and counter-irritants (blisters, liniments, &c.), which draw the blood to the surface, or, at all events, away from the lungs. It will, therefore, be doubly necessary to take care that the liver and kidneys are acting, and for this reason it is that so many medicines, useful in bronchitis, act upon one or other of the above organs—as, for instance, minute doses of ipecacuanha, the balsams, colchicum, iodine, squills, &c. The *diet* may be nourishing, yet not of a heating character. Light puddings and milk form very useful articles of food, and, in great prostration, animal broths and jellies are required; but fermented liquors will seldom be suitable, though there are some stages of the disease in which they are indispensable. Still, as a general rule, they may be excluded from our consideration.

FORMULAS USEFUL IN CHRONIC BRONCHITIS—

Take of Oxymel of squills,
Mixture of acacia,
Syrup of poppies,
Olive-oil, ā ℥ss.

Mix, and give a tea-spoonful as often as the cough is troublesome. (*Useful to allay the irritation which often is the sole cause of the continuance of the disease.*)

Or, take of—
Oxymel of squills, ʒiij.
Wine of ipecacuanha, ʒj.
Comp. tincture of benzoin, ʒiss.
Mixture of acacia, ℥j.
Comp. tincture of camphor, ℥ss.
Camphor mixture, ℥vj.

Mix, and give two table-spoonfuls every four hours. (*An excellent general remedy when the inflammation has subsided.*)

Or, take of—
Diluted hydrocyanic acid, min. xxiv.
Syrup of tolu, ℥ss.
Distilled water, ℥viiss.

Mix, and give two table-spoonfuls three or four times a day. (*In chronic bronchitis when there is too great action of the heart.*)

Or, take of—
Spirit of turpentine, ʒj.
Syrup of tolu, ʒiij.
Mixture of acacia, ℥j.
Comp. tincture of camphor, ℥ss.
Camphor mixture, ℥vj.

Mix, and give two table-spoonfuls three times a day. (*A stimulating and bracing mixture.*)

Or, take of—
Sal-volatile,
Comp. tincture of camphor,
Oxymel of squills, ā ℥ss.
Mixture of ammoniacum, ℥viss.

Mix, and give two table-spoonfuls three times a day. (*In cases of great exhaustion.*)

Or, take of—
Compound squill pill,
Extract of hemlock, ā ʒj.

Mix, and divide into twenty-four pills, one to be taken every four or six hours.

1192. IN SPASMODIC BRONCHITIS (par. 145), commonly known as *asthma*, or *spasmodic asthma*, the treatment required is somewhat different from that which will relieve the ordinary forms of bronchial inflammation. The disease consists in congestion, united to spasm of the contractile fibres of the bronchial tubes, and hence the indication would theoretically be to relieve both at the same time by remedies appropriate to them. Now, we know that there is no remedy like vomiting (and its milder stage nausea) for relieving congestion; and we also know that few medicines have greater power over spasm than camphor and opium, or hemlock, the latter being to be preferred, because it does not tend to check the secretions like opium in large doses, which alone would be useful in these cases. Now, in practice this combination succeeds in a marvellous manner in most attacks of genuine spasmodic asthma; and, as far as my experience goes, I have never known it to be used without relief in a very short time. The pills, as ordered below, should be repeated at short intervals (the more severe the attack, the shorter they should be up to a quarter of an hour), until vomiting is produced, when they may afterwards be given every three or four hours, and when the spasm has ceased, some one or other of the more stimulating mixtures ordered for bronchitis may be employed to relieve the chronic condition of inflammation in which the mucous membrane is left. In very urgent cases bleeding may possibly be required, in order to give time for the remedy to act, and to prevent the danger of effusion from the excess of blood which prevails in plethoric subjects. But the instances, in which such a practice is really called for, are rare, though it is often thoughtlessly adopted, because it gives instant relief, forgetting that the quantity of blood is soon made up again; and then comes another attack and another bleeding, until in the course of a few years the vessels are full of a colourless fluid, which bears a very small resemblance to natural blood. I have known more than one patient bled on the average twice a month for three or four years, without any necessity for the practice, as proved by the subsequent adoption of a different plan. Blisters and other counter-irritants are also useful in relieving the ordinary bronchitis left behind after the spasm has ceased, but they are wholly useless at the time, though mustard-plasters may be tried as affording some little relief; as also do very hot foot-baths, especially with half a pint of vinegar and a quarter of a pound of flour of mustard, mixed together and put into the water:—

FORMULAS FOR SPASMODIC ASTHMA:

Take of Powdered ipecacuanha, gr. viij.
,, Camphor, gr. xij.
Extract of conium, gr. xxiv

Mix, and divide into eight pills, one of which is to be given every quarter of an hour till vomiting is produced, and afterwards every four hours;

Or, take of—
Sulphuric ether,
Compound tincture of lavender, ā ℥ss.
Comp. tincture of camphor, ℥j.
Camphor mixture. ℥vj.

Mix, and give two table-spoonfuls every four hours. (*To be used when bleeding has been employed, and there is relief, but attended with too great exhaustion for the above remedy.*)

1193. SENILE BRONCHITIS (par. 146) almost always occurs in debilitated and worn-out constitutions. It must be treated by stimulating remedies generally, united with ammonia and anodynes. The following are as likely to be found efficacious as any others, though the disease is often very intractable:—

Take of Sesquicarbonate of ammonia, gr. xl.
Comp. tincture of camphor, ʒvj.
Mixture of ammoniacum, ℥iij.
Camphor mixture, ℥iv.

Mix, and give two table-spoonfuls every four hours;

Or, take of—
Sulphuric ether, ℥ss.
Balsam of copaiba, ʒiss.
Mixture of acacia, ℥j.
Syrup of poppies, ℥ss.
Camphor mixture, ℥vj.

Mix, and give two table-spoonfuls three times a day.

1194. THE TREATMENT OF BRONCHITIS IN THE CHILD is given at page 303.

1195. **Hooping-cough** occurs so generally in childhood that its treatment has been included among the "diseases of children" at page 304. Should it attack the adult, the remedies must be the same, but increased in strength in accordance with the age and power of constitution.

1196. **Croup**, for the above reasons, has been included in the same division of this book. (See pages 304, 305.)

SECT. 3.—TREATMENT OF INFLAMMATION OF THE MUCOUS MEMBRANE OF THE STOMACH AND BOWELS.

1197. **Acute Gastritis** in the adult is exceedingly rare, except as an effect of poison, under the chapter on which the treatment suited to it, when so caused, will properly come. Sometimes, however, it *may* make its appearance without such cause (see page 52), so that it may be right to allude here to the remedies proper for its removal. These are general or local bleeding; blisters to the pit of the stomach; ice swallowed frequently, and in small quantities; diluents, such as barley-water, linseed-tea, gruel, &c.; and calomel and opium in grain, or half-grain, doses of each every four hours; or two or three drops of the diluted hydrocyanic acid, in distilled water, every four hours, if there is much sickness or distressing nausea. The disease is not so uncommon in children, and its treatment is alluded to at page 305. **Chronic Gastritis** is also rather uncommon in the adult, differing only from the acute form in the severity of the symptoms, and requiring nearly the same principles of treatment. The bowels are often obstinately confined; and as the stomach is very irritable, there is great difficulty in keeping any aperient medicine on it. The compound rhubarb pills are the most likely to effect this purpose, and may be given when required. (See *Dyspepsia.*)

1198. **In Diarrhœa** so much depends upon the form in which it occurs, and the cause which has produced it, that its treatment must be split up into several divisions (see par. 159).

(*a*) *In excessive irritability* of the absorbents of the small intestines, where there is simple diarrhœa, with healthy though loose motions, the main agent in its removal is a careful supervision of the diet; all fruits and green vegetables must be avoided, as well as every coarse and mechanically irritating food. Much will depend upon the digestive powers, for it often happens that an article of food in itself likely to be bland and mild, becomes the reverse in consequence of its being obnoxious to the particular stomach, so that it is passed on in a state unfit for absorption. This is often the case with milk, which will then cause flatulence and diarrhœa; while, with most people, its effect is rather to cause constipation than otherwise. Arrowroot, rice, and fine wheat-flour, made into various plain dishes, suitable to the weak stomach, or the mutton-custard, the receipt for which is to be found at page 248, must constitute the only articles of food as long as the looseness continues. At the same time, tea, coffee, and all watery slops must be eschewed, as they are sure to run through the bowels without even allaying the thirst, and carrying with them also the more solid food previously taken. If these measures do not succeed, the following soothing mixture may be tried:—

Take of Aromatic confection, ʒj.
Comp. chalk mixture, ℥viiss.
Tincture of catechu, ʒiij.

Mix, and give two table-spoonfuls after every loose motion.

(*b*) *In bilious diarrhœa*, when the flow of bile seems to be the only reason for its occurrence, it is seldom necessary to do more than moderate it by the use of arrowroot, rice, and port wine, either mixed with these articles, or mulled (see par. 898). Sometimes, however, the constitution is so delicate that the chalk mixture given above may be required, and it will seldom fail to keep the action of the bowels within safe bounds.

(*c*) *Watery diarrhœa*, when not caused by the presence of *scybalæ* (see page 53), but arising either from want of tone, or from mental emotions, may generally be restrained by the mineral acids, according to the following formulas:—

Take of Diluted sulphuric acid, ʒij.
Syrup of poppies, ʒiij.
Water, ℥viiss.

Mix, and give two table-spoonfuls after every loose motion;

Or, take of—
Diluted sulphuric acid, ʒjss.
Rice water (par. 896) Oj.

Mix, and let the patient take it as the only drink allowed.

(*d*) *In watery diarrhœa caused by scybalæ*, the only successful plan is to get rid of them by an aperient which will act on the colon where they generally are lodged. For this purpose nothing succeeds so fully as a warm mercurial aperient, such as the following, after which the chalk mixture prescribed above will have the desired effect of stopping the discharge before it has exhausted the patient more than is absolutely necessary:—

Take of Calomel, gr. iij to v.
Extract of henbane, gr. iij.

Mix, and give over night, following it up the next morning with the annexed draught:—

Take of Compound decoction of aloes, ℥ss.
Tincture of rhubarb, ʒj.
Infusion of senna, ℥j.
Peppermint water, ℥ss.

Mix, and form a draught;

Or, take of—
Powdered jalap, gr. x to xv.
Subcarbonate of soda, gr. x.
Epsom salts, ʒj to ʒij.
Tincture of rhubarb, ʒij.
Infusion of senna, ℥iss.

Mix, and form a draught. (*Useful in collection of scybalæ, which are obstinately retained.*)

(*e*) *Mucous diarrhœa* may be caused either by the irritation of undigested food, or by *scybalæ*, and in either case the offending substance should be removed. For this purpose, if food is the offender, a very mild and simple aperient will suffice, such as castor-oil, or a dose of rhubarb and magnesia, or even the compound tincture of rhubarb in the dose of a table-spoonful, will often act; or a dessert-spoonful of castor-oil with ten or fifteen drops of laudanum may be tried, and generally with a successful result. But if *scybalæ* are to be looked on as the cause, they must be removed by the same remedies as are described at (*d*).

(*f*) *Diarrhœa, with frothy white motions*, which comes on in consequence of the total absence of bile and the accompanying fermentation of the chyme, is to be treated with a due regard to the re-establishment of the absent secretion. But here there is the difficulty of avoiding the increase of the diarrhœa, which all cholagogues produce whether mercurial or not. If the strength of constitution is considerable, this may often be disregarded; but in many cases it will be necessary to give blue pill, or calomel, or ipecacuanha, together with chalk and opium, or to use the powder of mercury with chalk, in which this necessity is already provided for. The nitro-muriatic acid may also be used as a check upon the diarrhœa, while it aids in the action on the liver; but the main resource in bad cases is mercury in some shape, in one or other of the following forms:—

Take of Mercury with chalk, gr. v.
Compound powder of ipecacuanha, gr. iij.

Mix, and give in treacle or honey twice a day;

Or, take of—
Blue pill, gr. v.
Compound powder of ipecacuanha, gr. iij.

Make into two pills with syrup, which are to be given every night till bile appears;

Or, take of—
Calomel, gr. j.
Purified opium, gr. ss.

Mix into a pill, which is to be given twice a day, till bile shows itself in the motions. In aid of the above give one or other of the following:—

Take of Diluted hydrochloric acid,
Diluted Nitric acid, ā ʒss.
Infusion of orange peel, ℥vj.
" rhubarb, ℥j.

Mix, and give two table-spoonfuls twice a day;

Or, take of—

Trisnitrate of bismuth, gr. xl.
Compound powder of tragacanth, gr. xxx.
Water, ℥viij.

Mix, and give two table-spoonfuls twice a day.

1199. DYSENTERY (see page 53) does not in this country often require any other treatment than that which will be serviceable in diarrhœa, though even here the combination of ipecacuanha with opium will generally be found to agree, from the relief which the former drug affords to the congestion of the vessels which is so marked in this affection. Thus, small doses of blue pill or calomel, united with the compound powder of ipecacuanha will be the proper remedy, with starch and laudanum injections *per anum*. The diet should be rigidly confined to arrowroot, rice, sago, and tapioca and barley-water, or rice-water, should be the only drink allowed. Castor-oil and laudanum, as ordered for diarrhœa at par. 1198 (*e*), will also often relieve dysentery, as it occurs in this country; but, in the disease as it shows itself in warm climates, general and local bleeding are often indispensable, on account of the acute inflammation going on in the colon. Here an emetic should be given, consisting of ten or fifteen grains of ipecacuanha powder, with two grains of tartar-emetic, and afterwards small doses of calomel, ipecacuanha, and opium must be administered every two hours, together with opium and starch injections, and sometimes even ice to the interior of the rectum. When there is a torpid condition of the liver, as shown by the clay colour of the motions, nothing will do good until the secretion of bile is re-established, and for this purpose the quantity of calomel or blue pill must be increased.

FORMULAS USEFUL IN DYSENTERY—

Take of Calomel, gr. viij.
Comp. powder of ipecacuanha, ʒj.

Mix, and divide into eight powders, one to be given every four hours.

Take of Laudanum, ʒss. to ℥j.
Starch, ℥ij.

Mix, and throw up into the bowel, repeating it as often as it is returned;

Or, take of—

Acetate of lead, gr. ij to gr. iij.
Purified opium, gr. j.

Mix, and form into a pill to be given every four hours. (*To be used only in aggravated cases.*)

1200. ENGLISH CHOLERA (page 54) is a disease which very often demands domestic aid. Its treatment depends entirely upon the presence or absence of bile in the motions.

(*a*) *Where bile is present*, nothing more is required than to allay extreme sickness and cramps by creasote and opium, while excessive purging may be kept under by means of chalk mixture, or diluted sulphuric acid; but in most instances the unaided powers of nature, with careful diet, are quite sufficient, without any medicine at all. Very small quantities at a time of soda-water and brandy will often allay the vomiting, or the ordinary effervescing draughts may be tried (par. 1130).

(*b*) When there is no bile in the motions, and they are thin and watery or frothy, it is better to give calomel and opium in grain (or half grain) doses every four hours, and at the same time the diluted sulphuric-acid mixture, or the chalk mixture. 1198 (*a*, c). As soon as bile appears, the calomel may be discontinued.

(c) Sometimes the symptoms go on to resemble Asiatic cholera so closely that no one would hesitate to describe the case as one of that disease, if it occurred at a time when cholera was prevalent. In such a case, the *treatment* should be the same as described in the next paragraph for *cholera* itself.

1201. ASIATIC CHOLERA (page 56) is such a frightful disease, and so little within the reach of medicine, after it is fully established, that it is almost useless to give any directions at all. Nevertheless, as I have certainly seen great benefit from the plan advised in the following lines, I can recommend it as of more promise than any other which has hitherto been promulgated.

(*a*) *The premonitory symptoms* are those which are especially to be looked for, because it is here that treatment appears to exert its chief power, and by attending to them we find that, in most cases, the disease can be arrested. The first thing to be done is to give, as far as possible, entire rest to the body and mind, at the same time calming the fears which are naturally attendant upon the outbreak, by the assurance that with care it is sure to be alleviated in a short time. Then give one or other of the following mixtures, and if the liver is evidently torpid, and the motions are devoid of bile, join to them a grain of calomel every four hours, with half a grain of opium. The *diet* should be entirely of rice and arrowroot, or beef-tea thickened with arrowroot, or veal and rice, and no more fluid should be taken than is necessary to allay urgent thirst, when rice-water, acidulated with a few drops of diluted sulphuric acid, will be found to be the best drink (see page 377).

Formulas for Astringent Mixtures useful in the Premonitory Stage of Cholera—

Take of Aromatic confection, ʒj.
Tincture of catechu, ʒiij.
Creasote, min. xvj.
Chalk mixture, ℥viiss.

Mix, and give two table-spoonfuls after every loose motion;

Or, take of—
Diluted sulphuric acid, ʒiiss.
Tincture of opium, ʒj.
Water, ℥viiss.

Mix, and give two table-spoonfuls after every loose motion.

(*b*) *In confirmed Asiatic cholera*, when the stage of collapse is developed, there is no remedy, as far as I know, so powerful as creasote in full doses, given in the proportions prescribed below. This not only allays the vomiting, but it gives relief from the horrible cramps which are so painful to the patient, and appears to restore the circulation in a very remarkable manner. The saline treatment has been supposed to exert considerable influence in checking the mortality from cholera, and certainly in the outbreak of 1832 it seems to have had that effect; but in the last two invasions, wherever it was employed, it was found to be inert, and as far as my experience goes, it is wholly so. It consists in giving large quantities of salt and water, both by the mouth and by injection *per anum*, the salt being in the proportion of three table-spoonfuls to a quart of water. Acetate of lead and opium (two or three grains of the former to one of the latter) have also been said to be of great utility, but nothing which I have ever seen used has come up to the creasote. Whatever remedy is employed internally should be aided by friction of the skin, with hot flannel to the bowels, hot bottles or bricks to the feet and hands, and plenty of warm blankets over the whole body, taking care to use the friction entirely beneath the bed-clothes. Food is of no use whatever in this stage, as it is not digested, and only does harm instead of good. Where nothing else is at hand, brandy and opium may be given in very large doses, and sometimes a large dose (10 grains) of calomel given at the onset, and followed by the above remedies, appears to have had a good effect.

Remedies in the Stage of Collapse.

Take of Creasote, ʒij to ʒiij.
Chalk mixture, ℥viiss.
Tincture of opium, ʒij.

Mix, and give two table-spoonfuls every two hours, or after each loose motion;

Or, take of—
Chloroform, ʒj to ʒiss.
Tincture of opium, ʒij to ʒiij.
Mixture of acacia, ℥j.
Water, ℥viss.

Mix, and give two table-spoonfuls every hour, or oftener if it is rejected, or in very bad cases where the exhaustion is very great.

(*c*) *In the stage of reaction* great care is required, inasmuch as the powerful medicines which have been most probably used, begin now to exert the influence which was lost upon the previously paralysed surfaces. If diarrhœa continues, the chalk or acid mixture, ordered at par. 1198, may be used. Thirst is generally a very prominent symptom, and may be gratified by liberal draughts of cold water if there is no diarrhœa, or of rice water if there is. As soon as fever shows itself, which it often does, it may be treated on the same principles as are laid down under the head of typhus fever, the features of which it almost always assumes.

SECT. 4.—TREATMENT OF INFLAMMATION OF THE MUCOUS SURFACES WITHIN THE PELVIS.

1202. IN ACUTE INFLAMMATION OF THE BLADDER (par. 163) a warm hip-bath should be used every day, or even twice a day, with constant rest in the recumbent position, and the most rigidly abstemious diet, as far as animal food and stimulants of all kinds are concerned. The mildest farinaceous slops only should be allowed, and plenty of barley-water or linseed-tea should be constantly swallowed. Leeches to the lower part of the bowels will give some relief, or applied to the perinœum, in either case using the hip-bath afterwards for the bites to bleed into. A full dose of calomel (5 grains) should be given, followed by any ordinary aperient; and then one or other of the following mixtures may be commenced, trying them in the order in which they are here given.

Take of Liquor of potass, ʒj.
Tincture of henbane, ʒiiss.
Spirit of nitric ether, ʒiij.
Infusion of buchu, ℥viiss.

Mix, and give two table-spoonfuls every four hours;

Or, take of—
Nitrate of potass, ʒjss.
Mixture of acacia, ℥j.
Tincture of henbane, ʒij.
Liquor of acetate of ammonia, ℥j.
Camphor mixture, ℥vss.

Mix, and give two table-spoonfuls every four hours;

Or, take of—
Balsam of copaiba, ʒiss.
Tincture of henbane, ʒij.
Mixture of acacia, ℥j.
Spirit of nitric ether, ʒij.
Camphor mixture, ℥vj.

Mix, and give two table-spoonfuls three times a day.

1203. CHRONIC INFLAMMATION OF THE BLADDER (par. 163) will seldom require the application of leeches. The warm-bath is here also very soothing and useful, and, on the whole in other respects, the treatment need not differ much from that described in the last paragraph for acute inflammation of the same parts. But so much depends upon the cause of the disease, which can seldom be ascertained without the aid of a practical surgeon, that it is useless to dilate upon the treatment here.

1204. INFLAMMATION OF THE URETHRA (par. 164), like that mentioned in the last paragraph, is quite beyond the skill of the domestic practitioner. The same remedies may be tried as in the corresponding affections of the bladder; but, if the cause is to be looked for in stone, or in stricture, or any other unusual irritation, nothing but the advice of the surgeon will avail, and in all such cases he should at once be consulted.

1205. IN LEUCORRHŒA, or *whites*, (see par. 165) very opposite remedies may be required, according to the cause of the disease, and the condition of the general health. Whenever those employed are not *quickly* followed by relief, no time should be lost in calling in the aid of a competent medical attendant.

(*a*) *In whites*, accompanied by a plethoric state of the system, and having only recently made their appearance, an active aperient will often carry off the discharge, especially if it is followed by the use of a cooling mixture, such as the following:—

Take of Nitrate of potass, ʒiss.
Tincture of henbane, ʒij.
Liquor of acetate of ammonia, ℥j.
Antimonial wine, ʒiss.
Camphor mixture, ℥vj.

Mix, and give two table-spoonfuls every four hours.

(*b*) When the constitution is at a low ebb, and the countenance looks pale and flabby, tonic general remedies will be required, and, as a rule, steel will be of service; astringent washes and injections may also be used. These remedies, however, will chiefly be useful in young girls, for, if the symptoms of whites show themselves in after-life, there is generally, though not always, some organic disease, which will not be benefited by them.

Take of Tincture of sesquichloride of iron, ʒj.
Peppermint water, ℥viij.

Mix, and give two table-spoonfuls three times a day;

Or, take of—
Citrate of quinine and iron, gr.xl.
Bicarbonate of soda, ʒiij.
Syrup of orange-peel,
Tincture of cardamoms, ā ʒij.
Water, ℥viss.

Mix, and give two table-spoonfuls three times a day, with one of lemon-juice.

Take of Alum, ʒj.
Green tea, ℥xij.

Mix, and use as an injection or wash;

Or, take of Chloride of zinc, gr. xvj.
Water, ℥viij.

Mix, and use as an injection or wash.

(*c*) In any case the bowels should be carefully regulated, and the state of the liver should be noticed, giving the remedies ordered under the heads of *constipation* or *torpidity of the liver*.

CHAP. X.

TREATMENT OF INFLAMMATORY DISEASES AND ACCIDENTS AFFECTING THE SKIN.

SECT. 1.—TREATMENT OF SKIN DISEASES.

SUB-SECT. A.—GENERAL REMARKS.

1206. As the majority of skin diseases depend upon a depraved condition of the blood (certain component parts of which are therefore thrown out upon the skin), it is generally essential to act upon that fluid by means of medicines which are described by Dr. Headland as *catalytics*, see page 188. Some few, as "itch" and "scall'd head," depend upon animal or vegetable parasites, and can be cured by any local application which will destroy the life of the parasite without any absolute necessity for internal medicine, though in the instance of the latter the general health is almost always more or less implicated, and on that account requires assistance, and not to get rid of the presence of the fungus. Some diseases also arise from mismanagement of the skin, as for instance "acne;" and here the management must be altered, or the eruption will still go on. Very many of these complaints are induced by neglect in giving suitable food, the quantity or quality of which is too high or too low for the demands of the system, and for this reason *diet* is generally a very important consideration. There are some few in which the eruption is part and parcel of a decided fever, such as small-pox, cow-pox, chicken-pox, measles, &c.; and these have been classed along with febrile diseases, and are not included among the eruptions in which, though there is often fever, yet it does not exist to any great extent; and for this reason few require the treatment to be directed to the removal of fever by any decided antiphlogistic remedies. Still there are some exceptions, as, for instance, erysipelas, nettle-rash, shingles, and some others, in which the attending sympathetic fever is often very considerable, and in the first so great as almost to warrant its being included among eruptive fevers. It will be found that in the more acute eruptions, a considerable variation in the treatment is required, while in the more chronic forms, arsenic is almost a specific, and must be given in the great majority of cases if a cure is to be effected.

SUB-SECT. B.—RASHES.

1207. THE TREATMENT OF SIMPLE ERYTHEMA, as occurring in the newborn infant and in the older child, has been alluded to at pages 278 and 310.

(*a*) *Simple erythema in the adult* will merely demand an occasional aperient, followed by one or other of the cooling mixtures, the formulas for which are given under the head of *Antiphlogistics*, at page 342.

(*b*) *In erythema tuberculatum* (page 59) a brisk mercurial aperient should be given, if the disease is of an acute nature, and this may be followed by the same *antiphlogistic* treatment recommended above (*a*). But when the disease is chronic, no remedy but arsenic has much control over the eruption, and even that will not always cure it. Great care in diet, strong walking exercise, and attention to the health in all respects, will relieve, but not always cure, the disease when it is once established. Local remedies are not often justifiable, and will sometimes do great harm, by causing congestion of the brain. If arsenic is tried, it must be given in the doses, and with the precautions, which will be found at page 343.

1208. ERYSIPELAS, as attacking the infant, has also been discussed at page 278. The following applies to the adult.

(*a*) *In slight attacks of erysipelas*, wherever the symptoms described at pages 59 and 60 are clearly pronounced, no time should be lost in arresting the progress of the eruption, for however small the beginning, we cannot tell what the ultimate result may be. The worst cases are first seen as little patches of inflammation, from which they soon spread to become the formidable disease which often involves life, or the loss of a limb from mortification. If it appears on the head, it is better at once to apply the nitrate of silver in solution, by means of a brush, as the danger of extension to the membranes of the brain is so very great, while the remedy is in itself quite innocent, and only disfigures for a few days, at a time when confinement to the house is a necessary part of the treatment. But, inasmuch as this is a blood-disease, it is also imperatively necessary to give such remedies as shall purify it of its foul particles; and for this purpose a brisk mercurial aperient will be found requisite, followed by a mixture which shall act both on the skin and kidneys. In this way the inflammation almost always subsides in a few days, whereas it is rare to meet with an instance in which it does not spread over the whole head if treated in any other mode. If, however, any other part of the body is attacked, it may be treated internally in the same way, but externally fomentations of hot water may be applied every hour or two; and, in the intervals, flour may be dredged on the skin copiously with a common kitchen "dredger." The same plan may be adopted on the head, in the absence of nitrate of silver, or when its use is disliked or forbidden; though of its superior advantage, there is so complete a proof that no one ought to hesitate for a instant. The following are the formulas:—

Take of Calomel, gr. iv or v.
Antimonial powder, gr. iij.

Mix, and give as a powder, followed, after an hour or two, by the annexed draught:—

Take of Sulphate of magnesia,
Tincture of senna, ā ʒij.
Infusion of senna, ℥iss.

Mix.

Take of Nitrate of potass, ʒj.
Liq. of acetate of ammonia, ℥j.
Tincture of henbane, ʒij.
Spirit of nitric ether, ʒiij.
Camphor mixture, ℥vj.

Mix, and give two table-spoonfuls every four hours.

Take of Nitrate of silver, ʒss.
Distilled water, ℥ss.

Mix, and brush over the inflamed part of the skin twice or thrice daily.

(*b*) *In violent attacks of erysipelas*, when the swelling is great and there is considerable fever, blood must often be taken from the arm to a considerable extent; but it is seldom that the domestic observer will have such a case to treat except in situations beyond the reach of surgical aid. When such an unfortuuate event occurs, it will be wise to take blood, and then to have recourse to the above method of treatment if the eruption is confined to the head, using the solution very freely, and brushing it over the skin wherever there is the slightest indication of swelling. The same plan may also be adopted on the body or limbs; but in the latter the swelling is sometimes so great as to cause the band of *fascia*, in which the limb is enveloped, to strangulate the internal parts; and here surgical aid is demanded, and if not given, the whole skin often separates and dies (or sloughs), followed, as a matter of course, by the mortification of the internal parts. Here the only remedy is free incision, carried well down through the skin, and dividing the *fascia* itself, in a longitudinal direction. Now, as this requires a knowledge of anatomy, it is scarcely an operation which ought to be undertaken without some knowledge of the human body, even under circumstances which forbid the hope of any aid from an educated surgeon. But, nevertheless, if in such a desperate case as I am considering, the attendant has nerve enough to do it, several incisions, each two or three inches in length, may be carried down deeply through the skin on the *back* of the fore-arm, or the *outside* of the thigh or leg, without much risk of injuring any important artery. It is of no use unless they liberate the deep parts, and they must be sufficient in number to reach nearly from joint to joint. By means of poultices regularly applied, and in course of time the sloughs are thrown off, and the wound heals in the usual way. With regard to medicine in this kind of erysipelas, after the early treatment according to the plan advocated at (*a*) has been carried out for some days, and when the tension is relieved by the knife, or by the natural efforts having effected a slough—tonics will be the chief remedies, together with wine and beef-tea. Opium also often acts most beneficially, but there is considerable tact required in giving these remedies at the proper time.

THE FORMULAS REQUIRED ARE AS FOLLOWS:—

Take of Sulphate of quinine, gr. xij.
Tincture of opium, ʒj to ʒiss.
Diluted sulphuric acid, ʒj.
Tincture of cardamoms, ℥ss.
Water, ℥vij.

Mix, and give two table-spoonfuls three times a day;

Or, take of—
Decoction of bark, ℥xj.
Sesquicarbonate of ammonia, gr. xl.
Compound tincture of bark, ℥j.

Mix, and give three table-spoonfuls three times a day.

(*c*) *Abscesses* very often show themselves in the form of soft fluctuating swellings, after the inflammation has partially subsided; and they should *at once* be opened by the lancet, and their contents let out.

(*d*) *The diet* in the early stage of erysipelas should be of the lightest kind, but afterwards good animal broths (beef-tea, veal-broth, mutton-broth, &c.) must be given freely.

(*e*) *In the form of traumatic erysipelas*, described at page 60, as consequent upon the absorption of animal poison in the practice of cookery, &c., the nitrate of silver must be freely applied every day, but in spite of it the disease will go on for some weeks. The constitutional treatment should be that advised under (*a*), and tonics will seldom be required; but change of air appears to have a magical effect, and in a few days after it the eruption generally disappears, as if by a charm.

1209. Rose-rash (page 61) seldom occurs, excepting among young people, and for that reason its treatment is given at page 310.

1210. Nettle-rash (page 61), in the mild form in which it attacks children, is easily cured by the treatment described at page 310; but when it is met with in the adult it is often very obstinate, especially if it is not the result of some indigestible food such as shell-fish, when an active aperient readily gets rid of the tormenting itching which attends it. In the *febrile* form of nettle-rash, alluded to at page 61, bleeding must sometimes be adopted, in order to afford the degree of relief which will make life endurable, or an active saline aperient, followed by small doses of tartar-emetic, will sometimes be sufficient. Thus—

Take of Sulphate of magnesia, ℥ss.
Solution of carbonate of magnesia, ʒij.
Compound tincture of horse-radish, ʒj.
Camphor mixture, ℥j.

Mix, and let it be taken every six hours, until it acts freely on the bowels.

Or, take of—
Tartar-emetic, gr. iss.
Nitrate of potass, ʒiss.
Spirit of nitric ether, ʒiij.
Water, ℥viiss.

Mix, and give two table-spoonfuls three times a day, beginning as soon as the bowels are moved by the draught ordered above. If the itching is very intense, the following lotion may be used, with great care that it is not swallowed by mistake:—

Take of Diluted hydrocyanic acid, ʒij.
Glycerine, ℥j.
Rose water, ℥viss.

Mix, and form a lotion, with which the rash is to be frequently bathed. If the eruption still continues obstinate, one or other of the remedies ordered under the head of *antisquamics* at page 343, may be tried, the arsenical mixture being the most likely to be of service.

Sub-Sect. C.—Vesicular Eruptions.

1211. Herpetic Eruptions, though not confined to childhood, are much more common at that age than in after-life, and are therefore included under the part which treats of the diseases of childhood at page 311.

1212. Eczema (page 63) attacks all ages and both sexes indiscriminately, and for that reason its treatment has not been included among the diseases of children.

(*a*) *The treatment of simple eczema*, which is generally an acute and inflammatory affection, demands measures of a somewhat lowering nature, but not such as to make any great calls upon the strength. It is very apt to occur in scrofulous habits, and for that reason, if for no other, care is required in the use of remedies. The *diet* must be strictly cooling, being composed of farinaceous articles almost entirely. Small doses of saline aperients will serve, following upon the brisk action of a single dose of castor-oil, which merely clears out the bowels. Thus—

Take of Sulphate of magnesia, ℥j.
Cream of tartar, ʒij.
Lemon-peel, ʒij.
Boiling water, Oj.

Mix, and give a wine-glassful night and morning;

Or, take of—
Tartar-emetic, gr. j.
Cream of tartar, gr. xl.

Mix, and divide into eight powders, and give one three times a day. The itching may be relieved by the use of fomentations of poppy-heads, or by a warm bath made with hot water, in which two or three handfuls of bran have been boiled, and which will to a certain extent sheath the exposed surfaces from the air. If the skin does not rapidly regain its healthy tone, and throw off the diseased action, it passes into a chronic stage, and must be treated as such.

(*b*) *In chronic eczema*, whether of the head, or the face, or the body, arsenic is the only remedy on which much reliance can be placed, and if used with care, and not given on an empty stomach, it seldom does any harm whatever. If, however, it should produce obstinate diarrhœa, or if neuralgia follows its use, it must be discontinued, and its place supplied by some other remedy, such as colchicum or pitch, which last will occasionally exert considerable power over the skin in eczema. Local applications must sometimes be employed in addition, when the skin has become so habituated to the discharge as to be beyond all internal remedies; and of these the chloride of zinc is by far the most powerful, especially in combination with glycerine, which is useful by its power of preventing evaporation, and thus avoiding those cracks of the cuticle, which are so painful, and so difficult to avoid.

THE FOLLOWING ARE THE FORMULAS REQUIRED:—

Take of Fowler's solution of arsenic, min. xl.
Tincture of cardamoms, ℥ss.
Water, ℥viiss.

Mix, and give two table-spoonfuls three times a day, *with a full meal.* It is to be continued till the eyes become red, when the dose may gradually be reduced;

Or, Take of—
Wine of colchicum, ʒiij.
Tincture of henbane, ʒij.
Liquor of acetate of ammonia, ℥j.
Water, ℥viss.

Mix, and give two table-spoonfuls three times a day.

Take of Chloride of zinc, gr. xij. to xviij.
Glycerine, ℥j.
Rose-water, ℥vij.

Mix, and make a wash, which is to be brushed over the eruption at short intervals. When the eruption is confined to the legs, pressure will often be exceedingly useful in aiding the above application, and is to be applied by means of a bandage over it. The lotion is first brushed over, then a thin layer of soft linen, and then the bandage is to be rolled over all, taking care to make it lie smoothly.

(c) *Crusta lactea* in the child (see par. 181) requires merely a dose of rhubarb and magnesia, and then it will be found that the iodide of potassium will generally be more serviceable than a continuation of lowering remedies; two or three grains of the iodide, according to the age, may be given three times a day in a little water.

(d) *When eczema attacks the head*, and becomes chronic, it must be treated in the same way as described under (b). The hair will require to be cut short, and sometimes it is so matted with the scabs as to make it necessary to apply a poultice in the same way as for porrigo, which see at page 313. Afterwards the lotion of chloride of zinc (see *b*) acts in a most remarkable manner, and is far superior to the nitrate of silver in this eruption. Should it fail, however, the nitrate may be used of the following strength:—

Take of Nitrate of silver, ʒss.
Distilled water, ℥ss.

Mix, and use with a brush every day.

(e) *In mercurial eczema* it is chiefly necessary to remove the cause, and use hot fomentations of warm water externally, with mild aperients internally, and the eruption soon ceases.

(*f*) *Eczema, when it attacks the skin round the navel of new-born infants*, is to be relieved by the use of plenty of warm water, and great care to keep all irritants from contact with it. Fuller's earth will sometimes agree better than violet powder with it, but one or the other should be applied with profusion.

(*g*) *Solar eczema*, resulting from exposure to the sun's rays, is so common as to be familiar to everybody's experience. It merely requires bathing with tepid water, and the application of the following lotion, which affords instant relief:—

Take of Glycerine, ℥ss.
Rose water, ℥viss.

Mix, and bathe the parts freely every second or third hour, or oftener, if required.

(*h*) *Washerwoman's itch* is also relieved by the above lotion, but as long as soda is used it is apt to continue.

(*i*) *Grocer's itch* is a most troublesome affection, if the irritation of the sugar, which is its cause, is continued. Here, also, the chloride of zinc and nitrate of silver are equally of service, but the former leaving no stain is to be preferred. It must be used in the form given at (*b*).

1213. SCABIES OR ITCH has been alluded to at page 312 as almost confined to children among the middle classes, and its treatment is therefore given with that of their diseases.

SUB-SECT. D.—TREATMENT OF BLEBS.

1214. PEMPHIGUS AND POMPHOLYX have been comprehended at page 312, under the diseases of children.

1215. RUPIA (page 66) is sometimes exceedingly obstinate, the difficulty arising from the fact that it chiefly occurs in cachectic habits whether young or old. It is always desirable to attend to the departure from health, whatever it may be, and to endeavour to improve it, without much reference to the eruption, which will then disappear if the efforts in that direction have been fully successful. Hence it is somewhat difficult to assign any particular remedy, or class of remedies, as adapted for the cure of rupia, because it occurs in different conditions of the system, which may be the result of bad food, or over indulgence in food as to quantity or quality, or the abuse of mercury, or from other excesses of a more marked character. For this reason, *alteratives* are the medicines which are said to be required; but any drug is an alterative if it will change the condition from disease to health. Bark, steel, iodine, sarsaparilla, and mercury in small doses, may be tried according to the particular state of the constitution which is affected; and local stimulants, such as nitrate of silver and savine ointment, will often aid in the healing of the ulcerated surface which remains. When the scabs fall off altogether, the eruption may be said to be beyond the reach of domestic skill; and the above directions are only given in the forlorn hope of affording some slight guide should a case of rupia occur at a distance from all medical help.

SUB-SECT. E.—PUSTULAR ERUPTIONS.

1216. ACNE (page 66) in its mildest form (*acne simplex*) is almost confined to the age between fifteen and thirty-five, during which period of life a very large proportion of the inhabitants of this nation are more or less troubled with it. The treatment will a good deal depend upon the precise form in which the disease shews itself.

(*a*) *In simple acne*, especially if it appears chiefly on the face, much may be done by the local management of the obstructed follicles, which cause the inflammation and consequent formation of matter. But this often aggravates the mischief for a time, because the very treatment which removes the cause, by emptying the follicles which are as yet uninflamed, tends to inflame those in which, from congestion and thickening, the condition is already commenced, which rapidly leads to the development of acne. In order to understand this, it is necessary to reconsider here the nature of the eruption, which consists in an inflammation set up by nature to get rid of the cheesy matter which has been for a long time collecting in the follicles of the skin. Thus, the disease is partly composed of obstructed follicles free from inflammation, and partly of others in all stages of that process, from a slight degree of the early stage to the final collection of matter which washes away the original cause (the curdy matter). From this explanation, it can be readily understood that in the case of this eruption, three things are to be attended to—1st, to improve the health, so as to give the skin only its own proper work to do, and not that also of the liver and kidneys, in purifying the blood; 2nd, to accelerate the regular passage out of the ducts of the matter secreted in them; and, 3rd, to reduce the inflammation whenever it is practicable to do this without arresting the natural cure of the obstruction. In carrying out *the first* of these objects, it is necessary to act regularly upon the liver, or the kidneys, or sometimes on both, when they are both defective in action. Many people who take too much food allow their internal organs to become torpid from a want of proper exercise, and in them the skin is often induced to aid in the task of carrying off the impurities of the blood, which ought to be chiefly done by the liver and kidneys. These same people are too apt to neglect their skins, and the consequence is that the follicles are not only unnaturally filled with curdy matter, but their mouths are glued together by a film, which prevents their contents escaping. In order, therefore, to fulfil the *first indication, the diet* should be of the simplest kind, and proportioned to the amount of exercise taken. The eruption generally appears at the time when the body is ceasing to grow, and while as yet the appetite has not lost the stimulus given to it by the necessity for rapid assimilation at that time. The quantity and quality of the food may, therefore, be kept somewhat below that which has been fixed as the allowance up to the period of the appearance of the eruption, and the amount of fermented liquors especially should be greatly reduced. In addition to diet, if the liver is not acting very freely, the first of the following mixtures may be given; or, if that organ is doing its duty, the second may be tried. Sometimes the two may be used in alternate weeks with great advantage.

Take of Ipecacuanha wine, ʒiss.
Liquor of potass, ʒj.
Infusion of rhubarb, ℥ij.
Tincture of cardamoms, ℥ss.
Infusion of cherayta, ℥vss.

Mix, and give two table-spoonfuls three times a day.

Or, take of—
Spirit of nitric ether, ℥ss.
Decoction of dulcamara, ℥xiss.

Mix, and give a wine-glassful three times a day. *The second indication* is carried out by the free use of a sponge and warm water, followed by a thick towel, with which the skin is to be deeply rubbed for some minutes. The sponge should be applied for a quarter of an hour at a time, each part being bathed in succession, and the purpose for which it is used will be facilitated by dissolving half a tea-spoonful of bicarbonate of soda in the water. In this way the film is first removed from the mouths of the follicles by the hot water, aided by the soda if used, while at the same time the cheesy matter is rendered moist and soft, and then the towel used slowly, and with as little *surface irritation* as possible, squeezes it out. But this rubbing, as a matter of course, aggravates the inflammation already in existence, and for about a fortnight or three weeks the eruption looks much worse, that is say, until the crop of pimples in existence when the plan was commenced upon has all suppurated and subsided, after which the appearance of fresh ones is gradually diminished in numbers, and in course of time, as the secretion becomes more healthy, and is regularly squeezed out every day, there is no further succession; but in order to attain this desirable end, the practice of bathing and rubbing must be continued for years. *The third indication* is fulfilled by the use of lotions to the inflamed part, but as these only palliate an apparent mischief which is really a natural effort to cure, they should never be used, except in the early stage of the employment of the bathing plan, in order to counteract the aggravation of the inflammation which it produces. For this purpose the following lotion may be applied:—

Take of Liquor of acetate of lead, ʒj.
Rose water, ℥viij.

Mix, and use as a lotion after each bathing;

Or, take of—
Glycerine, ℥ss.
Chloride of zinc, gr. xij.
Rose water, ℥viiss.

Mix, and use as a lotion.

(*b*) *Acne rosacea and acne indurata* are almost beyond the reach of medicine in most cases, unless they are treated in the very early stage of their appearance, which is seldom done. The vessels in course of time become so enlarged and congested that, even if the health is improved, the removal of the cause does not seem to get rid of the effect. The first thing necessary to be done is to get the stomach and bowels into good order, for which purpose it will generally be the plan to treat them according to the rules laid down under the chapter on *chronic disorders of the stomach*, which must be referred to for the purpose. When this is done, and it is found that no progress has been made, the restorative mixture composed of the mineral acids, at page 341 may be tried; and as a last resource, if the anxiety to get rid of the eruption is very great, arsenic may be given in the form ordered at page 343 under *antisquamics*. This last remedy will be found to palliate the mischief greatly, and often for a time will appear to effect a cure, but it seldom is permanently useful in this complaint. Local applications may also be tried, the most effectual of which is a blister applied in the usual way, but this remedy is not likely to be often used in domestic practice for this eruption, inasmuch as its application necessitates a complete seclusion for some days. The following, however, may be tried with some small prospect of advantage, and in slight cases with considerable benefit. The first acts chiefly by the pressure which it produces in contracting as it dries, and is only a temporary relief where the appearance is of importance for a particular occasion.

Take Collodion, and apply it rapidly with a large camel hair-brush *once* only over the affected part.

As it dries it contracts and empties the vessels, but only remains on for about twelve hours, after which the thin layer must be removed and a fresh one applied. Collodion is sold coloured with a flesh tint for this purpose;

Or, take of—
Glycerine, ℥ss.
Chloride of zinc, gr. xvj.
Rose water, ℥viiss.

Mix, and use as a lotion at night;

Or, take of—
Ointment of nitrate of mercury, ʒss to ʒj.
Ointment of zinc, ℥j.
Creasote, min. iv.

Mix, and apply at night.

1217. SYCOSIS (page 67) is to be treated constitutionally on the same principles as acne. Locally the following ointment will often afford great relief if applied at night, while the glycerine wash may be used after shaving:—

Take of green Iodide of mercury, ʒss. to ʒj.
Lard, ℥j.

Mix, and apply with the finger at night.

Take of Glycerine, ℥ss.
Rose water, ℥viij.

Mix, and use as a wash in the morning.

1218. THE TREATMENT OF PORRIGO has been alluded to at page 313 among the eruptions incidental to children.

1219. IMPETIGO has also been treated of in the same chapter, at page 314.

1220. ECTHYMA (page 69) may generally be left to nature, and allowed to run its own course, as no treatment seems to be of much service. If a blind-boil appears in any situation where it is irritated by the friction of the dress, a piece of soap plaster spread on leather is to be applied, and kept on till the inflammation has subsided.

1221. THE GENUINE BOIL (*furunculus*, page 70), if not very large and troublesome, is also better left alone, merely guarding it from friction by the soap-plaster as directed in the last paragraph. If, however, the swelling and pain are considerable, a poultice should be applied, and kept constantly on; and it should either be of linseed-meal or oatmeal, or a mixture of both (see page 264). Water-dressing (par. 953) and the spongio-piline (par. 954) are used by some people for this purpose; but they do not afford the same amount of relief as the above poultices. As soon as the "core," or little white slough has come away, and the boil feels soft and looks red in the central open cavity, the poultice may be discontinued, and then either the water-dressing (953) or the ointment of nitric oxide of mercury will be the best healing application. If the boil is unusually large and painful, with a hard base, it affords great relief to divide it completely with a lancet, cutting through the surrounding hardened ridge until the one-half may be separated from the other, by which means the compression exercised upon the small nerves is removed, and the pain is relieved in a few minutes. No simple opening in the same way as for the ordinary abscess gives any relief as there is no collection of matter until the "core" is almost separated, and by that time the pain is relieved, and the time for the use of the lancet, with advantage, has gone by. Constitutional treatment is of little use in preventing boils, but of course if the health is bad it must be attended to.

1222. CARBUNCLE (par. 199) being a compound boil, must be treated on the same principles; but here the incision is absolutely required, and as early as possible, in order to prevent an extension of the disease, and the probable loss of life from the excessive drain on the system. As soon as the carbuncle shows itself, the best plan is to carry the knife right across it in two directions, so as completely to cut through the hard ring of inflamed skin surrounding it, and the larger the size of the carbuncle, the greater the necessity for this cross incision, and for carrying it entirely through the whole length and breadth of the disease. There is, sometimes, a considerable amount of bleeding at the time, but this seldom lasts many minutes, and affords relief to the loaded vessels. After the operation, a large poultice of linseed-meal or oatmeal (page 264) should be applied at once, and changed every eight hours, and in the course of a fortnight or three weeks, it may be hoped that the "cores" or sloughs will separate, leaving a healthy surface of granulations to fill up the cavity made by the destruction of the cellular membrane and skin. The poultices must be continued until these red granulations have risen to the level of the surrounding skin, after which the ointment of nitric oxide of mercury may be substituted for them, dressing the sore like any other. *The constitutional treatment*, in the case of a carbuncle, must at first be of the ordinary *antiphlogistic* kind, the proper medicines being a gentle aperient, followed by a febrifuge, as indicated at page 342. But as soon as the first feverish symptoms are at all abated, and when the carbuncle has been opened and begins to discharge, bark, wine, rich beef-tea, and other kinds of highly nourishing diet must be had recourse to. The quantity of wine taken is often as great as in typhus fever, and the prostration of strength is also as marked as in that disease.

SUB-SEC. F.—TREATMENT OF PAPULAR ERUPTIONS.

1223. THE VARIOUS KINDS OF LICHEN (page 70), with few exceptions, merely require the ordinary treatment by salines and mild aperients. Sometimes, however, blood must be taken away in plethoric subjects, and at others, mercury or arsenic must be given; but these cases are too rare to need description here.

1224. PRURIGO (page 71), as it generally shows itself in people of middle age, is a most intractable complaint, and as it almost always depends upon some vitiated condition of the blood, or sometimes on mismanagement of the skin, so it takes a long time to restore them to a healthy state. In children, and in extreme old age, it is still more incurable, and in the latter it may be considered as one of the penances that must be borne. It is difficult to say what constitutional remedy will be likely to suit, because the deviations are so various, but generally stomachics will be the most serviceable, joined to warm baths, at rather a high temperature, that is, about 100° or 102°. The hydrocyanic-acid wash (page 345) may be tried, and is found to afford relief sometimes, but it fails quite as often as it succeeds.

SUB-SECT. G.—SCALY ERUPTIONS.

1225. LEPRA AND PSORIASIS (see page 71), whether they are to be considered as separate diseases or not, must both be treated alike. In the first place, the constitutional remedies are almost entirely confined to arsenic and pitch, the former of which may be relied on as being possessed of very great power, if persevered in for a sufficient length of time. It must be taken in pretty full doses, and regularly until the redness of the eyes shows itself, and then gradually reduced in quantity, but still taken in some dose or other for months together. If five drops do not seem to be borne, then try three, two, or even one; but the largest dose which the system will bear without injury, should be given for at least two or three months. The doses of these remedies are given at page 348, under *antisquamics*. But, independently of these internal medicines, a great deal may be done in mitigation of the disease by the constant use of glycerine and chloride of zinc, in the form of a lotion, which may be regularly brushed on every night, with a soft brush, or put on with a piece of sponge. This wash is made as follows:—

Take of Chloride of zinc, gr. xij.
Glycerine, ℥ss. to ℥j.
Rose water, ℥xj.

Mix, and form a wash. *Diet* is of very little use in these scaly eruptions, further than as tending to promote health, which of course will aid in all reparative processes.

1226. THE ORDINARY DANDRIFF (page 71) will require nothing but the local application of the following wash, together with the occasional use of some *animal* oil in small quantities:—

Take of Glycerine, ℥j.
Chloride of zinc, gr. xxiv.
Eau de Cologne, ℥jss.
Water, ℥ixss.

Mix, and form a wash for the head, to be used every day.

SUB-SECT. H.—TUBERCULAR DISEASES.

1227. LUPUS, or the *corroding tetter* (page 72), as observed in the description of its appearance at the above page, is beyond the reach of domestic medicines; but the following local remedy has been found so useful as a palliative, that the formula for its preparation is here given:—

Take of Glycerine, ℥iij.
Chloride of zinc, gr. xxiv.
Rose water, ℥iij.

Mix, and form a wash which is to be brushed on every day at the time of dressing, and after carefully washing the parts from all discharge. If too strong reduce it by adding water.

SUB-SECT. I.—SPOTS AND MARKS.

1228. CLARET MARKS, LIVER SPOTS, and other permanent marks are wholly beyond the reach of remedial treatment.

1229. FRECKLES may be reduced very considerably in depth of colour, and sometimes almost entirely got rid of, by the use of a weak solution of chloride of lime or soda, in union with glycerine. The following is the formula, which must be reduced in strength by the addition of more water, if it makes the skin smart:—

Take of Solution of chlorinated soda, ℥ss.
Glycerine, ℥j.
Rose water, ℥xss.

Mix, and form a wash for the face and hands, which is to be used freely every night and morning with a small sponge.

SUB-SECT. J.—DISEASED GROWTH.

1230. WARTS sometimes disappear in a very short space of time, so that their progress towards a sound state is not noticed, and all at once it is discovered that they are well. Hence it is that charms and various simple remedies have gained credit for what they have not deserved, just as in many other diseases where the *sequence* is mistaken for an *effect*. The most common and safe remedy is the lunar caustic (nitrate of silver), applied in the solid form, first cutting off the thick and rough cuticle on the surface, until the blood either shows itself or the small red points are visible, which mark the terminations of enlarged vessels. The surface is then wetted and the caustic well rubbed in, after which it should be allowed to dry, and in two or three days the scale formed must be sliced off again, and the caustic should be reapplied, repeating this operation until the whole has disappeared; but to carry this out requires considerable courage, as it gives great pain after the first or second application. Strong nitric acid is much more effectual, and also in the end gives less pain, because a single application is generally sufficient. Great care must be taken not to put on enough of the liquid to run over the surrounding parts, as it destroys everything it touches. The mode of using it is as follows:—Procure a small quantity of the acid, and also a small glass rod, or a slate-pencil will do, vegetable matter being at once charred and destroyed by it. Then soak the wart for half an hour in warm water, dry the surface well, and as soon as the surrounding skin is dry, and before the thick covering of the wart has had time to become so, fix on the former a piece of plaster, with a hole cut in it corresponding to the wart, which should project through it. Then take up a drop of the acid on the rod and touch the wart with it, allowing the liquid to run well into its substance. In a few minutes the whole may be put into water, and afterwards a linseed-meal poultice should be applied till the wart drops off. Corrosive sublimate also acts very well as a caustic in getting rid of warts, and it should be applied with the same precautions as the acid, but in powder, wetting the wart thoroughly and then rubbing it in, and allowing it to remain on it in a moist state for ten minutes, after which the whole may be put in water as above, and poulticed.

1231. The Treatment of Corns depends upon their nature (see page 72). *Hard corns* must be cured by paring away, *as fast as it grows*, the hard cuticle either with the scissors or knife, and then in bad cases wearing a piece of soap-cerate on buff-leather. *Soft corns* are of a half-warty nature, and always occur between the toes. They are actual growths from the skin, which secrete a thickened and imperfect cuticle. The *best remedy* is great cleanliness, washing the parts with soap constantly, and then applying the solid nitrate of silver, which causes the cuticle to become dry and to shrink up. A piece of carded cotton should *regularly* be worn between the toes, and with these precautions soft corns may always be rendered free from pain, though not cured without repeated applications of the caustic. Blue-stone acts quite as well, but it requires more frequent application. In either case, after a few days the dry cuticle should be pared off and the caustic re-applied; but care is required in the use of the nitrate of silver, or an ulcer of a painful character will be produced.

1232. Condylomata only arise from a want of due attention to the secretions at the various outlets, and if these are thoroughly kept clean none will appear. When they exist they may often be got rid of by the repeated application of savine powder dusted on them in a dry state. Corrosive sublimate in powder is a certain cure, but its action is too energetic on the surrounding parts to warrant its use in domestic surgery.

1233. Bunions more properly come under the head of inflamed synovial bags or *bursæ*, as they are called (see page 84), but as they are generally classed with corns, their treatment is included in this section. They almost always occur over the ball of the great toe, in consequence of the enlargement of the heads of the two bones composing the joint, and the extreme pressure of the shoe upon the *bursa*. If the inflammation is very great, apply a few leeches to the part, and let the bites bleed into a foot-bath; then use the following lotion until the swelling is removed. If the general health is affected it must be attended to; and if there is any feverishness, an aperient and antiphlogistic mixture (see page 342) may be necessary:—

Take of Tincture of arnica, ʒij.
Liquor of acetate of lead, ʒj.
Spirit of wine,
Vinegar, ā ℥j.
Camphor mixture, ℥ixss.
Mix, and form a lotion.

Sub-Sect. K.—Treatment of Diseases of the Hair and Nails.

1234. Baldness (see page 73), when

it occurs as the result of old age, is wholly beyond the reach of art, though if it comes on prematurely, the use of a stimulating application will often postpone the unfortunate day. There is generally a falling off of the hair during, or after pregnancy, and for this the undermentioned stimulating oil is almost a complete specific:—

Take of Powdered cantharides, ℥j.
Purified spirit of turpentine, ℥iij.
Neat's-foot or trotter oil, ℥v.

Mix together, and let the whole stand for a fortnight, shaking them up together once or twice a day. After the expiration of the above time pour off the clear liquid, and apply it every other day. If it irritates the skin *much*, increase the quantity of oil; and if, on the contrary, it does not make it feel warm, then diminish the oil.

1235. DISEASE OF THE HAIR, in which it falls off in patches, has been treated of at page 309, under the chapter on *Diseases of Children*, in whom it chiefly occurs.

1236. THE MANAGEMENT OF THE HAIR is also entered into at pages 307 and 308.

1237. THE PROPER MODE OF CUTTING THE NAILS, both of the fingers and toes, is alluded to at page 309, as well as the treatment of the ordinary diseases to which they are subject, including GROWING IN AT THE CORNER, and WHITLOWS.

SUB-SEC. L.—TREATMENT OF CHRONIC ULCERS OF THE LEG, &c.

1238. ULCERS, as ordinarily met with in the body, are of four kinds—1st, *the healthy ulcer*; 2nd, *the indolent ulcer*; 3rd, *the inflamed ulcer*; 4th, *the fungous ulcer*; and 5th, *the gangrenous or sloughing ulcer*.

1239. IN THE HEALTHY ULCER the edges are smooth, and adhere to the granulations, which are neither inverted, everted, or raised above the level of the surrounding skin. The granulations should be red and small, and as soon as they rise to the level of the surrounding skin, a whitish film makes its appearance all round at the edges, and gradually spreads inwards, until it unites at the centre, while it becomes thicker and more skin-like at the circumference, until at last the whole surface is skinned over. The discharge is thick and creamy, and is readily removed from the surface of the sore or adjacent parts. The *treatment* consists in allowing the part as much rest as possible, keeping it clean by dressing it in the most simple manner once a day, and protecting it from injury (either mechanical or the result of cold) by means of a bandage, and using very slight pressure by the same means. No dressing is more generally useful than the water-dressing, used with tepid water (par. 953). Sometimes, however, a simple ointment, such as that made with the nitric-oxide of mercury, or spermaceti, agrees even better; but the water-dressing is the best general dressing of all those which have been tried under my notice.

1240. THE INDOLENT ULCER is characterized by an oval or circular form, with thick raised edges, which are hard and almost insensible to pain. The surface of the ulcer is smooth and glossy, free from granulations, and of a colour which is sometimes whitish or flesh colour, sometimes brownish, and at others greyish. The surrounding parts are generally in a state of permanent congestion, firm, incompressible, and of a bluish-red colour. The discharge is scanty, thin, and pale. This ulcer is the prevailing one met with among the labouring poor, to whom it is almost confined. The *treatment* consists in rest to the limb in a horizontal position, if possible; with good diet, and if necessary the use of bark and opium, or other tonics, or stomachics, internally. The local methods of curing the ulcer itself are almost numberless, nearly all, however, depending for success on maintaining an even pressure over the whole leg. The existence of this kind of ulcer is so often dependent upon a varicose condition of the veins, that a proper support to them will often, by removing the cause, get rid of the effect also. Stimulating ointments are those which are most generally useful; but very often nothing will succeed until the hardened edges are reduced, and for this purpose they are sometimes shaved off with a razor to a level with the surrounding skin, or they are liberally touched with lunar caustic once or twice a week, while a bread poultice, or water-dressing is being used. Sometimes Peruvian balsam will agree, and at others the ordinary yellow basilicon, or the ointment of nitric oxide of mercury will be more successful in procuring healthy granulations; but when they are employed, a piece of lint must always be put over them, and then a larger surface of soft linen doubled, after which a long bandage is to be smoothly applied all the way from the instep to the knee. Some years ago Mr. Baynton introduced a very good method of treating these ulcers by means of broad strips of soap-plaster brought round the limb, each one overlapping that below it, until the whole is encased in the material; but it requires some practice to adapt them evenly to the surface, and the plan is scarcely fit for domestic use. The greatest modern improvement in the care of this kind of ulcers, is that lately introduced by Professor Syme of Edinburgh, which, at first sight, would appear to be a very barbarous method of cure; but when its good effects are compared with the amount of pain given, the balance will strike those who have tried the plan as very greatly in its favour. Certainly, as far as my experience goes, I should class it as one of the greatest improvements in modern surgery, doing away with one of the *opprobria chirurgicorum*, and relieving many a poor labouring man from a most dire calamity. I have often cured most extensive ulcers, which had resisted all ordinary treatment, in a few weeks by its means; and if the pain is not objected to, I should now never try any other method —one great advantage being that the new skin formed after its use is so unusually strong and healthy. The way in which it is employed is as follows:—A blister-plaster should be spread in the ordinary way, of such a size and shape as to embrace the whole ulcer, and about half an inch beyond it. This is to be applied and kept on for twelve hours, when it may be removed, and the parts will certainly look much worse than before, so as to alarm a timid person who has no confidence in the result. But by the use of the water-dressing, or of a bread-poultice, in a few days the cuticle covering the thick edges comes away, together with a layer of granulations, leaving a healthy ulcer, with a red and healing surface, but extending fully half an inch beyond its original dimensions. Nevertheless, from this time the progress is wonderfully rapid, aided by the ordinary dressings, which would be employed in other cases; and in the course of five or six weeks the largest ulcer is reduced to very small dimensions, and in most cases, actually healed in a firm and sound manner.

1241. In the Inflamed Ulcer the edges are red, and the surface is devoid of granulations, looking raw and pulpy, or foul and livid. The discharge is profuse, and often streaked with blood, and the surrounding parts are swelled, hot, and tender, as well as giving such acute pain, even when carefully shielded from external injury, as to cause considerable constitutional disturbance. *In the treatment*, the first thing to be done is to subdue the inflammation by general and local remedies adapted to that purpose, such as a low diet, aperient medicines, tartar-emetic in small doses, or calomel and opium in half-grain doses. Sometimes leeches applied to the surrounding parts will be of use, but they occasionally give rise to erysipelas, and on that account are not very safe. The leg should be kept up somewhat above the level of the body, and warm bread poultices with occasional warm fomentations, will be found to agree the best. As soon as these measures have reduced the inflammation, the ulcer may be treated in either one or other of the methods already described, according as it becomes healthy or indolent, or like the next kind, if it should throw out fungous granulations, which is very often the case.

1242. THE FUNGOUS ULCER is commonly called "proud," and the granulations are known as "proud flesh." Here, however, a fatal mistake is often made, by mistaking healthy granulations for this kind, and applying caustics to them whereby the healing process is often materially retarded, in fact, as long as they are applied. The rule is plain enough, never to use caustic to them, until the granulations rise above the level of the skin, for if below that level, although they may be weak and of a fungous character, they require stimulating, not destruction, and for this purpose a remedy possessing the power of an actual caustic is not required. *The definition* of the fungous ulcer is one in which the granulations are larger, paler, and less numerous than in the healthy ulcer, and present a smooth flabby appearance, each having a bulbous extremity, instead of a point, and showing very little appearance of containing blood, so that there is no tendency to bleed on the slightest touch, and the sore is by no means sensitive when handled. Usually they rise above the level of the surrounding skin, because there is no tendency to form the film described at par. 1239, and in course of time they overlay the margins, and conceal them from view. *The treatment* consists in strengthening and improving the general health by tonics and a liberal diet; while at the same time stimulants must be applied to the granulations, and if they rise above the level of the skin, or overlap the edge of the ulcer, they must be destroyed by some kind of caustic, the most generally useful being the nitrate of silver. It is not necessary to apply this to the whole surface, but only to the edges, and then, with the aid of pressure, the middle will sink to a proper level. The sulphate of copper (blue-stone) is sometimes used, but though less painful than the nitrate of silver, it is also less effectual, and must be applied much more frequently. Let it be well understood that whichever is employed should only be used while the granulations are too high, being too caustic and destructive to act as stimulants to growth, though sometimes they may have that effect after clearing away a foul surface. Careful pressure is here all-important, and for the purpose of effecting it without cutting unequally, nothing is so easy of application as melted wax, which may be brushed over the ulcer pretty thickly, by repeated strokes of a brush dipped in wax nearly cool, that is, only just sufficiently warm to keep in a liquid state. A roller applied over this is prevented from acting unequally, because the wax after cooling forms one solid mass, which exactly fits the granulations and presses upon all parts alike. Dry lint is also often used to keep down exuberant granulations, and is very useful in that way. For the purpose of encouraging the growth of healthy granulations, some surgeons employ stimulating washes, such as those composed of the nitrate of silver, or the sulphate or chloride of zinc, or the black-wash; others use powders, as, for instance, calomel or cinchona bark, finely powdered and dusted over the sores; while others, again, have recourse to ointments, as, for instance, the ointment of the nitric oxide of mercury, &c. The following are the formulas generally employed for these purposes:—

Take of Nitrate of silver, gr. v to xv.
Distilled water, ℥j.

Mix, and use on lint, which is to be dipped in the solution, and then laid over the sore, covering it up with the ordinary water-dressing (see page 264);

Or, take of—
Sulphate of copper, gr. x.
Water, ℥j.

Mix, and use in the same way as the last;

Or, take of—
Chloride of zinc, gr. iss.
Water, ℥j.

Mix, and use as above;

Or, take of—
Calomel, gr. viij.
Lime water, ℥j.

Mix, and use as above. (*This is the ordinary black-wash.*)

Or, use the ointment of nitric oxide of mercury (page 239);

Or, use the ointment of creasote (page 239);

Or, use the ointment of zinc (page 240). This may also be mixed with either of the above ointments in equal proportions;

Or, take of—
Ointment of nitrate of mercury, ʒj.
Ointment of zinc, ℥j.

Mix, and use.

1243. THE GANGRENOUS, or SLOUGHING ULCER, sometimes called *phagedenic*, is marked by extremely irregular edges, with a reddish tinge in the surrounding skin, extending a good way from the sore. The edges are generally inverted, and the surface of the sore is dark-red or livid in colour, and covered with a thin and bloody discharge. The sore enlarges very rapidly, partly by ulceration and partly by sloughing, the varying proportion of these two processes causing several subdivisions to be made in this kind of sore. It occurs only in broken-down constitutions, or in gaols, or hospitals, where large masses of patients are assembled together in every stage of disease. The *treatment* consists in repairing the general health by liberal diet, wine, and bark with opium, and in applying the strongest stimulants and caustics to the wound, so as to cause it to assume a new action; but, fortunately, the management of this kind of sore seldom comes within the province of domestic surgery, as it is entirely beyond its reach.

SECT. 2.—TREATMENT OF WOUNDS OF THE SKIN, &c.

SUB-SECT. A.—GENERAL REMARKS.

1244. WOUNDS ARE DIVIDED into—1st, *incised*; 2nd, *lacerated or contused*; 3rd, *punctured*; 4th, *gun-shot*; and 5th, *poisoned*.

1245. WOUNDS ARE HEALED by—1st, *adhesion* (or as it is sometimes called "the first intention"); 2nd, by *granulation*; and 3rd by *scabbing*.

1246. UNION BY THE FIRST INTENTION (see par. 124), requires that the divided surfaces shall be clean, and uninjured by more violence than is sufficient to cause the division; that is to say, they must not be much impaired in vitality by being bruised. The bleeding also should have ceased or nearly so, the two surfaces must be brought closely together, the air must be excluded from them, and the inflammation following the wound must not be permitted to increase beyond a certain limit, the lower the better, within reasonable bounds. In order, therefore, to procure this adhesion, it is necessary to effect the four following purposes:—viz., 1st, to stop the bleeding by the means most suitable to its extent; 2nd, to clean the wound of all foreign matters, including any clots of blood; 3rd, to bring the parts evenly together, and maintain them so for three or four days; and 4th, to guard against the action of the vessels rising to the height of inflammation, which is followed by the secretion of *pus*, instead of organizing the lymph already thrown out.

(*a*) *The bleeding is stopped* by exposure to the air, or by the application of cold water, or by the use of styptics, or by the tying of the artery or arteries which may be wounded. Matico leaves form the best styptic which can be employed, the whole leaf being dipped in boiling water; and then, as soon as it is cool enough, it must be laid on the bleeding surface, and allowed to remain there for some time. Within a few hours after a wound is made, a glaze of lymph is poured out from the whole surface; and if the bleeding is at all likely to be troublesome it is better to wait for this time before bringing the parts together; indeed, in any case the union is much more likely to be successful if this delay is made. If an artery is to be tied, it must be looked for at the point where the blood pours out most freely; and if it really requires the ligature, it will pump out a stream of blood, though small in some cases, yet always in distinct jets or spirts, with an interval corresponding with the action of the heart. A fine silk or stout white thread should be chosen and waxed, and then passing a fine-pointed instrument through the open mouth of the bleeding vessel, it may be picked up and raised from the hollow in which it lies, and the thread or silk tied *tightly* round it, but not so strongly as to cut it entirely through. One end is then cut off close to the knot, and the other is suffered to hang out from the most convenient part of the wound, so that when it comes away after having done its duty, the whole may be drawn out without much difficulty. The small ligatures, which are the only ones likely to be tied by the domestic operator, usually come away in from six to nine days; and after that time, if they do not, they may be gently pulled at every day. There are several instruments (called *tenacula*), used for the purpose of taking up arteries, and if the operator possesses a case of surgical instruments, he will find one in the shape of a fine and sharp hook, or another resembling a small pair of thin spring-forceps, which will lay hold of the end of the vessel by the power of its spring, if the blades are previously opened, and hold it while the operator ties the ligature.

(*b*) *The cleansing from foreignmatters* merely demands the careful use of a sponge and water, the only caution required being to avoid a foul sponge, which may infect the wound, and to "dab" rather than to rub the surface in sponging, inasmuch as the latter mode gives excruciating pain, and is wholly unnecessary.

(*c*) *The parts are brought together* by plaster, or by suture, or by bandage, or by any or all of these combined. *Plasters* for this purpose are either the common *diachylon* or *adhesive* plaster, or the transparent *isinglass*-plaster, or *collodion*, the first being the most easy of application, but the last having the virtue of being unirritating, and allowing the daily inspection of the state of the wound through its material. The *diachylon* merely requires to be warmed, the best plan for effecting which being to wrap each piece round a jar containing hot water, applying to this the plain surface so as to avoid the sticking which would otherwise ensue. The *isinglass*-plaster requires hot water to be lightly sponged over its surface, and then after a minute it may be applied; but its manipulation demands some practice and skill. *Collodion* has no advantage over isinglass, and occasions considerable smarting, besides which it is not transparent. It is applied by dipping strips of lint in it, and then holding the parts together after they are laid on, until they have had time to dry. A considerable shrinking of the collodion takes place, which brings the parts firmly together, and it is useful on that account, if on no other. *Sutures* are of various kinds, but the only one calculated for domestic use is what is called "the interrupted suture," which is nothing more than an ordinary single stitch tied with a common knot. A curved needle is passed through the two edges of the wound, taking care that when brought together it will fit properly, and putting in as many as will suffice to keep it in position. After all the needles are passed through, and the silk or thread cut off from each, they are to be tied one after another, an assistant helping in bringing the parts together, and holding the single knot with the forceps to prevent its slipping, while the operator ties it a second time. It is usual to aid the suture, and take off the strain on the skin which it causes, by applying plaster over or between the several sutures which are put in, and for this purpose nothing answers so well as the isinglass-plaster, which has quite sufficient strength for the purpose, and the sutures have the good effect of keeping the parts together while the plaster is drying. In three or four days, these sutures must be cut out by dividing each close to the knot or through it, and then drawing them out, and as they can be readily seen through the transparent plaster, it is only necessary to snip a small hole in it, in order to get at them. The *bandage* is sometimes used by itself, a piece of lint dipped in the blood being first applied, and then the bandage over it, trusting in some measure to the adhesive quality in the blood to keep the parts together. Position aids the coaptation of parts very considerably; so that, if a cut is made in a limb, it must be kept bent if the injury is on the inside, or straight if on the outside. In any case, the rule is to take off all unnecessary strain upon the edges of the wound.

(*d*) *The action of the vessels must be moderated* by general antiphlogistic treatment, comprising starvation and cooling medicine if necessary, and the local application of cold water over the isinglass-plaster or collodion, neither of which are dissolved by it, but allow its use over them without loosing them, though the former is, to a certain extent, and in course of time, acted on by it. There is no plan at all equal to the irrigating process, described at page 265, for arresting inflammation in wounds; and it may be used with advantage over either of the above plasters. Even contused wounds may, by its aid, be made to unite by adhesion, as we shall presently see.

1247. Granulation (see page 43) must be adopted as the means of uniting a wound when it is too much contused to allow of any chance of adhesion, or when there is such a loss of substance as to prevent the two surfaces being brought together. Very often the attempt is first made to procure adhesion, and after its failure, recourse is had to the granulating process. In this case, at the end of a few days, the edges are seen to become swollen and red, and are felt to be very painful; the margins next separate, and matter is poured out. At this stage all sources of irritation should be removed, especially ligatures, if not already taken out, and the most soothing dressing, such as the various poultices, must be employed; or a warm-water dressing, if it is found to suit the particular state of the parts. Adhesive plaster, either of diachylon or isinglass, may often be employed to aid the work of granulation by bringing the parts together, and thus leaving smaller space to be filled up. Under this plan of treatment, if the patient is in a healthy state, the surface becomes clean in a few days, from healthy granulations springing up, and the ulcer may be treated exactly as described under the last section, according to the particular condition of the parts.

1248. When a Scab is allowed to form, which should only be in superficial wounds, new skin is formed without granulation, by a process sometimes called the "modelling process," and without any secretion of *pus*. Lymph is thrown out, which becomes organized and converted into skin, and the healing takes place very rapidly. If, however, the inflammation is not kept down *pus* is secreted, and the scab is either raised by it and washed away, or its edge is lifted, and the matter escapes, granulation then going on beneath the scab.

Sub-Sect. B.—Treatment of Incised Wounds.

1249. In these Wounds, after stopping the bleeding, the edges are brought together by the method described at page 397, and union by the first intention is attempted. If this succeeds, the wound is at an end, or if it fails, the granulating process must be had recourse to. In small incised wounds, nothing answers better than a piece of lint dipped in the blood, and retained by means of a bandage, taking care to bring the parts as neatly as possible together, or collodion may be used instead, by means of lint dipped in it, and it will by its contraction materially aid in bringing the edges together.

Sub-Sect. C.—Lacerated or Contused Wounds.

1250. Wounds which are made by any other than a sharp cutting instrument, are either lacerated or contused, or, in ordinary language, torn or bruised. Their edges are ragged or uneven, and in the contused wound the skin is injured to such a degree as to lose its vitality, either partially or in its entire substance. In their *treatment*, union by the first intention is not often to be expected, but sometimes by good management, and in healthy subjects, it may be obtained, and very often partially so; but even this is a great object, as by its means the divided parts are maintained in their proper places during the process of granulation, which is thereby materially expedited. Therefore, unless the wound is so much contused as to lead to the belief that adhesive union is wholly out of the question, the attempt should be made for a few days, for even though it may be abandoned at the expiration of that time, it will have done no harm. In these wounds no plan gives such promise of success, in the object which we are now considering, as the irrigating process (see page 265). By its means I have obtained perfect union in many cases, which would have been utterly hopeless under other plans of treatment; and I confess that there are few injuries of the skin only, which would be dismissed by me as beyond its power of healing by the "first intention." For instance, in frightful lacerations of the hand caused by machinery, I have procured a complete union within a week; and on one occasion, when the whole of the inside of the fingers were cut so deeply as to expose the sheaths of the tendons, by a coarse circular saw, the hand was quite sound within the same period, though the fingers were of course rather stiff. I should, therefore, advise its being tried according to the plan laid down at the above page, and with the simple precaution of allowing the patient to regulate the temperature of the water, so as to make it most agreeable to himself. This varies greatly in different cases, and at the various seasons of the year; but, by attending to this rule, it will be found that the patient is sure to discover by his sensations which is the right temperature, for any other, instead of affording relief, is sure to aggravate the pain. The wound may be stitched up, if necessary, and plasters of isinglass, or of collodion, may be applied over them, so as to keep the edges together as nearly as possible. Very often it will be found impossible to do more than make the skin touch at certain points only, and the union can only take place there, but at other situations the skin is fixed by the effusion of lymph; and, when the irrigation is withdrawn, in order to encourage the necessary work of granulation, the parts do not gape open as they otherwise would do, and there is not nearly so much to be done in filling up. During the continuance of the irrigation, no granulations are thrown out, so that it must not be continued beyond the first four or five days, after which the warm water dressing or bread poultice, or sometimes the linseed-meal poultice will do all that is wanted in encouraging their growth. Stimulating ointments are sometimes employed, or friar's balsam, in order to increase the rapidity of the growth of these granulations; but after accidents such remedies are seldom wanted, and the above are to be relied on as sufficient for all purposes. When the granulations have filled up the cavity, the wound becomes an ulcer, and is to be treated as such according to its nature (see *Ulcers*).

SUB-SECT. D.—PUNCTURED WOUNDS.

1251. PUNCTURED WOUNDS are those made by a narrow-pointed instrument, usually to a depth out of proportion to the size of the external opening. They are very apt to be followed by *tetanus*, and are invariably attended by more inflammation than most other kinds of wound. The *treatment* varies according to the depth of injury and the amount of contusion or laceration which has accompanied the puncture. If the wound is merely through the skin, or a little deeper even, union by the first intention should be attempted, first arresting the bleeding by cold water, and then covering the opening by isinglass-plaster or collodion, or by diachylon in their absence. In deeper wounds the cold-water dressing may be tried without closing the orifice, and at the same time allowing any oozing to go on. If, however, the wound is very deep, it is better to promote external suppuration by warm bread and water poultices, unless there is extensive bleeding, when it must be stopped by dilating the wound and reaching the divided artery, if possible, with a view to tie it. This, however, is beyond the reach of domestic surgery.

SUB-SECT. E.—GUN-SHOT WOUNDS.

1252. BY GUN-SHOT WOUNDS, we understand those inflicted by a pistol ball, or that from a musket or rifle, or by any splinter or fragment driven by the force of gunpowder against or into the body. Sometimes they present a more or less direct canal through, or into, which the ball or fragment has passed; while, at others, there is a violent bruise caused by the striking of a "spent ball." In all cases the opening made by the entrance of a ball is smaller than that left by its exit, and the former is almost always smaller than the ball which made it, owing to the elastic nature of the skin allowing it to stretch considerably. The pain occasioned by these wounds at the time they are made is not very great, but as soon as inflammation sets in it is intense. There is, however, a certain shock to the nervous system, which is sufficient in itself to destroy life in severe cases, and which must always enter into the consideration of those who undertake the *treatment* of a case of gun-shot wounds. Here, then, the *first indication* is to get rid of the collapse, caused by the shock, by using encouraging language, and, if necessary, giving brandy or other *stimuli;* but of these last as little as possible should be administered, inasmuch as they serve to increase the inflammation, which is about to set in as a matter of course. The next thing for the ordinary attendant to do is to arrest bleeding, if it occurs, by the application of pressure (see hemorrhage), and afterwards he may turn his attention to discover if any bone is broken, and if such is the case, to provide for the emergency by steadying the limb in the most natural and comfortable position. After this is done, a cold water dressing, or a warm fomentation may be applied, about the choice of which there is a difference of opinion, and then the case should be left till the visit of a surgeon, who must be found, if the injury is more than a mere flesh-wound, with the ball passed through. If, however, there is only the above comparatively slight injury, a simple cold water dressing will suffice for the cure, together with entire rest for the muscles which are injured; and, in course of time, the inflammation causes the sloughing of a layer of contused material around the wound, which is afterwards filled up by granulation, and the cure is effected. In case either small shot or a ball are lodged just beneath the skin, it may be advisable to attempt their extraction by cutting down upon them, and picking them out of their seats; but as they often remain without causing any irritation, it is quite a matter of doubt whether this should ever be attempted—at all events by any one but the experienced surgeon.

SUB-SECT. E.—POISONED WOUNDS.

1253. POISONED WOUNDS are those in which some poisonous matter is introduced at the time when the parts are divided. Here the local injury is not all that is to be attended to, for, in addition, there is often a serious constitutional disturbance, owing to the absorption of the poison, which requires peculiar treatment in each case.

(*a*) *Wounds, accompanied by the introduction of animal poison*, as in dissection-wounds, or those made by butchers, cooks, &c., should at once be well washed, and then most carefully sucked for some minutes. After this, if the poison is likely to be of a dangerous nature, it will be advisable to rub some nitrate of silver thoroughly into the wound, and to apply a poultice until it heals. A smart purgative may be given, and low diet and rest enjoined for a few days. If erysipelas makes its appearance, it must be treated according to the directions laid down at page 382.

(*b*) *In wounds made by the bite of a dog supposed to be mad*, it is most prudent to begin by washing the part most thoroughly, then sucking it freely, and after this if its situation will allow of it, excising every particle of the surface with which the saliva can have come in contact. Finally the nitrate of silver is to be rubbed into the raw surface left by the knife, and a poultice applied, or the warm-water dressing (page 264). Excision is believed by most surgeons to be the most safe method of preventing absorption, but some maintain that the caustic without it is to be preferred, but on what principle I am at a loss to know. *In case there is no doubt of the healthy condition of the animal*, and the bite was only made from anger or in defence, it will be sufficient to wash the wound thoroughly, and then suck it, touching it afterwards lightly with lunar caustic, as a precaution against the irritating effects of the saliva secreted by a dog in a state of great passion.

(*c*) *Wounds resulting from the stings of insects* are very painful, but seldom dangerous in this country. In the first place, the sting should be sought for and extracted carefully with a pair of fine forceps if present. Then suck the puncture and drop upon it, or rub gently into it, a little of the liquor of potass, or a strong solution of bluestone, both of which should be confined to the part itself, as they will inflame the surrounding skin if suffered to spread over it; or, *again*, apply eau de cologne, and persevere in its use for some little time, fanning or blowing upon it until dry, so as to produce evaporation, and thus cool the part; or, apply the simple cold-water dressing, which is, after all, I believe, as useful as anything in allaying pain and inflammation. The following formula is also found to afford considerable relief:—

Take of Liquor of acetate of lead, ʒss.
Laudanum, ʒj.
Vinegar, ℥ss.
Water, ℥iijss.

Mix, and use as a lotion constantly until the pain ceases.

(*d*) *For the bites of serpents* the local application of cold seems the most successful method of treatment. That of the viper is the only one which is met with in this country, and it is very seldom fatal, though attended by very distressing consequences. Iced water, or the coldest well-water which can be obtained, should be assiduously applied after washing and sucking the bites, in the same way as recommended for that of the mad dog. If erysipelatous inflammation occurs at a subsequent period, it is to be treated according to the ordinary method of combating that formidable disease (see page 382).

SECT. 3.—TREATMENT OF BURNS AND SCALDS.

SUB-SECT. A.—GENERAL REMARKS.

1254. BURNS AND SCALDS are alike in their cause, which is the application to the skin of heat above the temperature of 200° F., or thereabouts. They are usually classed according to the amount of injury done, from the slight inflammation unattended by vesication, to that in which the whole substance of the skin and muscles is completely disorganized, or even charred.

1255. BURNS AND SCALDS are attended by severe constitutional disturbance, varying with the amount of injury done, and especially with the extent of skin which is implicated. They are also often followed by considerable deformity, in consequence of the firm contraction of the new skin in the healing process, which is sometimes so powerful as to bring and fix the chin firmly down upon the chest, when the skin of the rib is burnt, or to raise the hand to the shoulder when the skin at the bend of the elbow is destroyed by this species of accident. Occasionally even a whole limb is utterly destroyed, and obliged to be removed.

1256. A CALCULATION has been made, founded upon statistical data, that it requires the following extents of surface to be burned or scalded in order to produce a fatal result; of course, as might be expected, the higher the temperature and the more severe the burn, the smaller surface must be implicated in order to destroy life. Thus, it is found that if the burn is only superficial, and occupies less than half of the entire body, it may be recovered from; while, if a thin layer of the true skin is destroyed and charred by heat, the burn will be fatal if it extends to one quarter only; and if the injury is deep enough to destroy the life of the skin in its whole thickness, and especially if the muscles and nerves beneath it are implicated, a burn, to the extent of a square foot in superficial measurement, will be attended with extreme danger to life.

1257. THERE IS A PECULIARITY in the early treatment of burns and scalds, which consists in the fact that they generally improve under local stimulants, which would be highly prejudicial to any other similar condition of the skin. It must be remembered, however, that at the time when turpentine is employed inflammation has not yet made its appearance, and the same may be said of the heat of the fire when applied to a burn directly after it has occurred. Both give great relief to the pain that is experienced, which is explained by supposing that a lesser degree of stimulus coming after a more severe one, has a tendency to prevent the congestion of blood which would otherwise take place from the effect of the heat on the nerves. In the same way rubbing with snow is the best remedy for frost bites, both appearing to support the homœopathic principle that "like cures like," but both failing from the moment that inflammation makes its appearance. It is a disputed point, I am aware, with many surgeons, whether turpentine does afford relief or not; but these gentlemen should try its effect upon their own persons, before they deny a fact which the experience of every one who has used turpentine on a burn of his own skin will not hesitate to confirm. The assertion that turpentine, if applied to a piece of sound skin, will raise a blister is undoubtedly true in most cases; and, in the same way, snow, if applied to the feet will freeze them, but if rubbed into them after they are frozen, it will do more good than any other remedy. Certainly the relief afforded by turpentine is most extraordinary, and far beyond any which cold water or any other application with which I am acquainted can lay claim to. Nevertheless, as I before remarked, it must not be continued beyond the time when inflammation makes its appearance, excepting in greatly reduced strength, the practical method of application consisting in gradually withdrawing it by mixing it with larger and larger quantities of linseed oil. In this way the stimulus is lowered by degrees, until at last oil alone is employed, and this being itself an excellent soothing application, is unobjectionable on every account.

SUB-SECT. B.—SLIGHT BURNS AND SCALDS.

1258. IN SLIGHT BURNS AND SCALDS, where there is merely inflammation produced in the true skin, with or without blistering of the cuticle, the *treatment* is chiefly confined to the relief of the pain which is experienced in the first instance, and to the prevention, as far as possible, of the blistering. If the injured surface is small, and there is nothing else at hand, it may be either plunged in cold water and kept there, or it may be kept constantly cold with linen rags dipped in cold water. But this is not applicable to large surfaces, as the system will not bear the extensive use of cold in such cases, and the choice is then between turpentine and carded cotton, or both, the one being introductory to the other. Having used turpentine extensively for many years, I am quite satisfied that it is by far the best remedy in the early stage, the only difficulty consisting in the substitution of some remedy at the period when the pain from the irritation of the nerves is allayed, and the inflammation begins to be manifested. Turpentine is almost always at hand, being used in most houses, and on that account is to be employed, if only as good as any other remedy; but as it really is better, according to my experience, it is on all accounts to be preferred. It may be brushed lightly over the burnt or scalded surface once in its neat state, then in a few minutes it should be re-applied, mixed with one-third of its weight of oil (linseed is the best, but olive oil will do), and after half an hour they may be used in equal proportions, for about one or two hours, at the end of which time each successive application may consist of a larger proportion of oil, until by the end of six or eight hours the turpentine is entirely omitted. During the period which has elapsed, there will have been time to procure plenty of carded cotton, in which the limb or the part should be thickly enveloped, covering in what oil and turpentine remains, which only serve to make the cotton adhere more closely. Common wadding will answer nearly as well as the fine carded cotton, and is always to be obtained at every village shop. It is to be kept on for about three or four days, when on removing it the skin is found to be quite healed. Many people use the cotton from the first, but it does not much allay the pain which is then felt, and I feel certain that the above is the best treatment.

1259. IF THE BURN IS FROM THE EXPLOSION OF GUNPOWDER, the skin of the face or hands should be at once examined, and if there are any grains of powder imbedded in it, they should be picked out, unless they are too numerous for that operation, when they must be left to take their chance, a poultice being on this account the best local application.

1260. IF BOILING-WATER HAS BEEN SWALLOWED, and inflammation of the larynx and pharynx has been produced, it must be treated according to the principles laid down for the treatment of laryngitis at page 371.

1261. THE FOLLOWING REMEDIES are those which are very commonly used in this class of burns and scalds:—

(*a*) Thick gum-water, spread over the burn to protect it from the air, and constantly renewed.

(*b*) Collodion used in the same way, and acting also as a stimulant on the same principle as turpentine. It, however, contracts so much in drying, that it is only adapted to small burns or scalds, in which it is very useful.

(*c*) Flour, constantly dredged over the surface, acts much in the same way as the cotton, but not nearly so beneficially.

(*d*) Grated potatoes form a good cooling popular remedy, applied as a kind of cold poultice.

(*e*) Glycerine, used with a feather or brush, acts very well, being less inclined to dry than gum-water, and, therefore, not cracking like that material.

(*f*) Lime-water and linseed-oil, mixed in equal parts, make the popular preparation known as Carron-oil from the iron-works where it was first used. It acts much on the same principle as turpentine and oil, and is almost equally beneficial.

SUB-SECT. C.—BURNS AND SCALDS IN WHICH A THIN LAYER OF THE TRUE SKIN IS CHEMICALLY DESTROYED OR CHARRED.

1262. IN BURNS, AND SCALDS FROM STEAM, INVOLVING THE SKIN TO THE EXTENT MENTIONED ABOVE, there is no extensive blistering of the cuticle, though in patches it may take place; but, instead of this, a thin layer of dead cutis is gradually thrown off by ulceration, leaving a raw surface, which must be healed by granulation. The best *treatment* here, also, is, I have no doubt whatever, that with turpentine or Carron-oil, continued for about six hours, after which the surface may be dressed with any mild absorbing ointment, such as that composed of finely levigated chalk, spermaceti, and linseed-oil mixed together in about equal proportions, but using more linseed-oil in winter, and less in summer; the object being to obtain an application of the consistence of thick cream. This is to be spread on lint or linen, and with it the sore is to be dressed every day, covering it lightly with a fine and soft bandage.

SUB-SECT. D.—DEEP BURNS OF THE SKIN.

1263. BOILING-WATER is not hot enough to produce this extent of mischief; nor is steam, excepting while still under high pressure, or at the very moment of its release. The early *treatment* is conducted much on the same principles as in the last sub-section; but as there are deep sloughs to come away, poultices must be used for that purpose. Nothing effects this object so well as linseed-meal, with which, after the turpentine and oil are withdrawn the whole surface should be lightly and smoothly covered, the poultice being made as described at page 264. As soon as the sloughs have separated, the poultice is no longer useful, as there is always a great tendency to high granulations (proud flesh), which their moist warmth greatly aggravates. Dry lint will often form the best remedy, or sometimes if dipped in the following astringent lotion, the discharge will be moderated in quantity, and at the same time the granulations will be kept down:—

Take of Acetate of lead, gr. xij.
Sulphate of zinc, gr. vj to ix.
Tincture of opium, ʒiij.
Water, ℥vss.

Mix, and use with lint as described above. In addition to the above remedies, lunar caustic or blue-stone must often be employed to keep down the fungous granulations which are so apt to appear. There is also another difficulty which is experienced when the burn has taken place at or near any of the joints, or on the neck, namely, the strong tendency to contraction in the new skin, which must be guarded against, by keeping the parts on the stretch, by means of splints or other mechanical contrivances of a similar tendency. It is much easier to prevent this contraction than to cure it after it has taken place, and, therefore, in all cases, where a burn has occurred at the bend of any joint, this precaution should be sedulously carried out from the moment that the sore begins to contract.

SUB-SECT. E.—BURNS IN WHICH THE DEEP PARTS ARE INVOLVED.

1264. IN SUCH CASES the mischief is so great that the constitution suffers a most frightful shock, which must at once be attended to. Ammonia and brandy will often be required in large quantities, with the addition also of opium, when the shock to the nervous system has been unusually great. But these are scarcely cases for domestic treatment, and therefore it is unnecessary to allude to the details required for their management. If such a case should occur without immediate surgical aid, and the pulse is very feeble with a cold skin and clammy sweats, it is always desirable to give brandy in sufficient quantities to procure reaction; and if the exhaustion is very great, sal-volatile may be mixed with it, in doses of thirty to sixty drops.

SECT. 4.—FROST-BITES, CHILBLAINS, CHAPS, &c.

1265. The rapid abstraction of heat from the surface of the body has nearly as prejudicial an effect as the sudden addition of it, by hot water or fire. The sensation also produced by extreme cold is not very unlike that of burning, and in cold climates it is necessary to be very cautious in touching metals when they are of the temperature of the surrounding air. The action of cold produces three different degrees of injury—1st, *frost-bites;* 2nd, *chilblains;* and 3rd, *chaps.*

1266. FROST-BITES, though rare in this country, do occasionally occur, and if they are treated properly soon after the occurrence, there is a chance of recovery without mortification, and the necessary amputation of the part. The best plan is to rub the part with snow, gradually allowing the water, which is produced by the melting snow, to be used in its stead, until at last the skin becomes warmed into life, if not utterly destroyed. If this state should be the result, amputation must be practised by the surgeon.

1267. CHILBLAINS, as most frequently occurring in childhood, though by no means confined to that age, are treated of at page 314; and the same remarks will apply to those which occur at mature age.

1268. CHAPS, whether they occur on the hands, or on the lips or elsewhere, are too well known by practical every-day experience to require a description of in the first Part. Their essence consists in excessive dryness of the cuticle, accompanied by inflammation, and both being caused by the contact of a cold wind, whether dry or moist. The consequence of this is, that the cuticle cracks in one or more places, and very often there is a deep cleft, produced by the extension of this crack downwards into the true skin itself. The remedy consists in the application of some soothing substance, which will protect the inflamed surface from the air, and at the same time keep the cuticle pliant and soft. Until lately various salves, lip-salves, &c., have been employed for the purpose; but since the discovery of glycerine its peculiar properties have superseded them all, except when a chap occurs on the lips where glycerine from its solubility is too easily washed away by the saliva. The pure Belmont glycerine may be scented with any essential oil, such as verbena, lemon, bergamot, &c., and in that state is to be freely brushed over the chapped surface every night; and also after each ablution, taking great pains to remove every remnant of the soap, and to dry the skin carefully afterwards. For the lips a salve must still be used; but the occasional use of a small quantity of glycerine will aid the greasy matter in keeping them soft:—

Take of White wax, ʒix.
Olive oil, ʒix.
Spermaceti, ℥j.
Oil of lavender, min. v.
Alkanet root, ʒss.

Macerate the alkanet for three or four days in the oil, then strain, and melt the wax and spermaceti in it. When nearly cold add the oil of lavender, and stir it till firmly "set." For decided sores caused by "chaps," COLD CREAM is the proper application, made as follows:—

Take of White wax, ℥ss.
Olive oil, ʒij.
Rose water, ℥ij.

Dissolve the wax in the oil at a low temperature, then add slowly the rose water, a few drops only at a time, beating the mixture smartly with a fork till the whole are incorporated, when the creamy substance, known as "cold cream," is fit for use, and may be put by in a jar till wanted. It will not keep more than three or four months without becoming rancid.

CHAP. XI.

TREATMENT OF INFLAMMATION AND CONGESTION OF THE CELLULAR MEMBRANE.

SECT. 1.—ŒDEMATOUS CONGESTION AND INFLAMMATION.

1269. In the treatment of this congestive condition of the cellular membrane, described at page 75 under the names of *œdema* and *anasarca*, the original cause of the mischief is to be attacked rather than this symptom, which is comparatively of little importance. Thus, when there is organic disease of the liver, the impediment to the flow of blood upwards to the heart from the lower extremities is so great that congestion often takes place in the cellular membrane, when its vessels happen to be peculiarly weak, and the consequence is that their watery contents ooze out into the meshes of the areolar tissue, causing it to swell and "pit." Here, then, it is manifestly absurd to apply any remedy with the hope of relieving the œdema, and unless the organic mischief in the liver can be palliated, there is little chance of removing its effect. So, again, when the kidneys are deficient in action, the same result takes place; but here the blood is overloaded with watery particles, and the oozing is increased by that circumstance. In the *œdema*, which takes place in *anœmia* and *chlorosis*, the congestion appears to arise from actual want of tone in these vessels, in common with the circulating system throughout the body, and not confined to the cellular membrane only. Hence, the use of tonics will relieve this kind of congestion in the cellular membrane; while they will generally be prejudicial when œdema is produced by liver or kidney disease.

1270. IN INFLAMMATORY ŒDEMA the vessels of the cellular membrane are actually undergoing a low kind of inflammation subsequent to congestion; but in this case there appears to be no unnatural increase of fibrine in the blood, and thus there is no secretion of lymph producing hardening, nor is matter thrown out in large quantities, and what is secreted is not confined by walls of lymph in "an abscess." Here, therefore, a general loss of blood would be injurious, and local measures of a cooling kind must be adopted; while, at the same time, the system is braced by bark or steel. This subject, however, is somewhat beyond the sphere of domestic medicine, being a matter requiring great delicacy and judgment.

SECT. 2.—TREATMENT OF PHLEGMONOUS INFLAMMATION.

1271. Inasmuch as this species of inflammation is generally of an active kind, and its evil consequences are soon produced, in the shape of hardening by the effusion of lymph, or in that of the formation of matter, or in sloughing, commonly known as mortification; it is here all-important to obtain *resolution*, if it can possibly be effected, by active treatment in the early stage. In mucous inflammation, as described at page 370, the result is seldom in itself very injurious, except when carried on to extremes; but here either of the above terminations requires a long and often a tedious process to restore the parts to a healthy condition, and in the case of sloughing there is an absolute loss of substance. For these reasons the measures necessary for relief must be adopted without a moment's delay, and their power must be calculated to effect the object which is desired with some degree of certainty. The most efficient of all agents in reducing phlegmonous inflammation is, no doubt, bleeding, which may be either general by means of the lancet, or local by the application of leeches or the cupping-glasses and scarificator. Next comes tartar-emetic, which has a wonderful temporary power in relieving this kind of inflammation, appearing chiefly to reside in its lowering effects upon the action of the heart. Calomel has also some influence, but this drug is mainly useful in getting rid of the deposit of lymph which is formed in some kinds of phlegmon, and, indeed, more or less in all. The local application of cold is very efficacious if the inflammation is near the surface, but otherwise it does more harm than good. Warm fomentations and poultices afford relief by encouraging a greater flow of blood into the skin; and in formation of matter, they accelerate its secretion, and also the absorption of the parts between it and the skin, and the skin itself, so that the matter may escape to the surface.

1272. IN PHLEGMONOUS INFLAMMATION of the ordinary kind, such as that which usually ends in the formation of healthy matter, if resolution cannot at once be effected by the various antiphlogistic means enumerated in the last paragraph, it is better at once to encourage its formation and progress to the surface by means of fomentations and poultices, the most efficient of which is the linseed-meal poultice, or that combining the two meals, as described at page 263. The bread poultice is very useful; but it does not accelerate the formation of matter like the others mentioned above. If a scar is of no consequence, and there seems no great tendency in the matter to spread or diffuse itself over a large surface (as in the case of a *fascia*, which is the membrane binding down the limbs), it is a doubtful question whether any advantage is gained by artificially opening the abscess before it reaches the surface; but if it occupies a position where any scar is objectionable, then a lancet should be thrust into it as soon as the matter is felt fluctuating beneath the skin, and where it is in a situation in which no important artery is in the way.

1273. DIFFUSED INFLAMMATION OF THE CELLULAR MEMBRANE (page 75) is seldom met with, except in severe cases of erysipelas, which are treated of at page 383. In such cases incisions through the skin should be practised as soon as the nature of the case is clearly made out, and on the plan there described.

1274. CHRONIC INFLAMMATION OF THE CELLULAR MEMBRANE (page 75) is a symptom of general ill-health, and must be treated by general remedies, including careful dieting, tonics, and fresh air. Sea air is particularly likely to be of service; but the precise nature of the bodily disease varies so much that it is almost impossible to lay down any rules which will be of any use as a guide. Where chronic abscesses occur in consequence of slow inflammation of the cellular membrane, their contents should be let out as soon as possible, on the plan advocated for scrofulous abscesses in general at page 327.

1275. GANGRENE (page 76) occurring as one of the consequences of inflammation, will require the aid of stimulating poultices of linseed-meal or yeast (see page 264) to aid in the separation of the dead parts from the living. This is effected by the process of absorption which removes a layer of living matter next to the dead, and therefore the vitality of the adjacent parts must be kept up in every possible way. Consequently, as soon as it is clear that gangrene (or mortification, or sloughing, which are synonymous terms) has taken place, the system must be supported by bark and ammonia, with the aid of opium in many cases, and also a liberal diet of strong animal broths and port wine. Powdered bark, or the lees of a port-wine cask, or vegetable charcoal, are all good local stimulants sprinkled over the linseed poultice, and are exceedingly useful dressings. The following formulas are added in case that any non-surgical person should have the charge of this horrible disease, under circumstances when no surgeon can be obtained:—

Take of Decoction of cinchona, ℥xij.
Sesquicarbonate of ammonia, ʒj.
Laudanum, ʒiss to ʒij.

Mix, and give three table-spoonfuls three times a day;

Or, give from 20 to 30 grains of powdered bark in a glass of port wine three times a day.

FOR THE POULTICE, make a linseed-meal poultice (page 264), and spread it on linen as there directed; after which the surface is to be thickly sprinkled with powdered bark, or with fine charcoal or wine lees, and then at once applied. In cold weather, after putting on the poultice a thick layer of wadding or carded cotton should be laid over it, and then a bandage over all.

SECT. 3.—PNEUMONIA.

1276. WHEN CONGESTION ATTACKS THE CELLULAR STRUCTURE OF THE LUNGS (see par. 229), and there is reason to believe that as yet inflammation has not begun, it is very doubtful whether bleeding, either from the arm or by leeches to the chest, will do good. Unless the patient is very strong and plethoric, such a thing should not be thought of, but the system should at once be brought under the action of tartar-emetic or ipecacuanha. In strong subjects the former should be used in pretty full doses, but not so large as are required by pneumonia, whilst delicate and feeble patients will generally be better treated by the latter. When the liver is torpid, calomel may be added at the same time in the form of pill; and if the tartar-emetic purges, it must be "guarded" by opium in such quantities as will effect that object. A mustard-plaster, or the liniment of ammonia, or spongio-piline may be at once applied to the chest, so as to draw blood to the skin, and afford the double relief of derivation and counter-irriitaton. Here one or other of the following formulas will be required:—

Take of Tartar emetic, gr. j to ij.
Nitrate of potass, ʒj.
Spirit of nitric ether, ʒiij.
Syrup of poppies, ℥ss.
Camphor mixture, ℥vij.

Mix, and give two table-spoonfuls every four hours;

Or, if the bowels are relaxed, add to the above mixture—

Tincture of opium, ʒj to ℥iss.

Or, substitute for the tartar-emetic, in the above mixture—

Wine of ipecacuanha, ʒij to ʒiij.

1277. Pneumonia (page 76) as occurring in the child, see page 315.

(*a*) *In the first stage of pneumonia in the adult*, excepting in very feeble subjects, it is always advisable to take blood either from the arm or from the chest by means of leeches. The quantity must depend greatly on the pulse, and on the strength and condition of the vessels as to plethora. Sometimes one bleeding, to the extent of a pint, will suffice, while at others double this amount must be abstracted at once, and an equal quantity at the end of twelve hours. In any case, the blood should be taken from a large orifice, and in the erect or sitting position, so as to produce as great a shock as possible, and with the smallest quantity of blood, which will have the proper effect. A certain degree of faintness should always be produced, and generally to the extent of absolute fainting, unless there is reason to dread any dangerous result from it, in consequence of disease of the heart. As soon as the immediate consequences of the loss of blood are gone off, so that medicine can be retained on the stomach, a dose of calomel may be given, which should be from five to ten grains, according to circumstances; and, if there is reason to believe that the bowels are loaded, at the end of an hour or two, a dose of castor-oil, or the ordinary black draught, should follow, so as to act pretty energetically. Then at once proceed to keep down the inflammatory tendency by repeated large doses of tartar-emetic, which at first will be returned from the stomach by vomiting, but by perseverance will be tolerated by it, and if the case is urgent, giving at the same time small doses of calomel with the tartar-emetic. This plan must be continued until the active inflammation is subdued, when the disease may be said to have entered upon its second stage of existence. The *formulas* proper for the first stage are as follows:—

Take of Tartar-emetic, gr. ij to iv.
Spirit of nitric ether, ʒiij.
Liq. of acetate of ammonia, ℥ss.
Syrup of orange peel, ℥ss.
Water, ℥viss.

Mix, and give two table-spoonfuls every three or four hours;

Or, add to the above, if it purges—
Tincture of opium, ʒj to ʒiss.

Or, give with each dose the following pill:—

Take of Calomel, gr. ss.
Confection of opium, enough to make into a pill.

The lowest possible diet must be strictly enforced.

(*b*) *In the second stage* counter-irritants, together with repeated leeching will be of most service, the former being applied to the front and the latter to the sides of the chest. Blisters are the best form for the purpose of counter-irritation, and may either be kept open (see par. 947), or they may be renewed again and again, as fast as the former ones heal. If there is reason to believe that lymph has been thrown out, producing "hepatization" as it is called, it will be necessary to continue the small doses of calomel, which will then require opium to be united with it, because it would otherwise run through the bowels without being absorbed. There is, of course, great risk of "salivation;" but this must be incurred in such a formidable disease as the one we are now considering. Sometimes tartar-emetic ointment has been found to act better than any other form of irritation, and it may be tried at this stage with good effect. A mild diaphoretic or diuretic mixture will generally aid in keeping down the tendency to inflammation which is seldom entirely gone. The *formulas* required are annexed:—

Take of Calomel, gr. iv.
Purified opium, gr. ij to iv.

Confection enough to make eight pills, one of which is to be given every four hours, or, in mild cases, three times a day.

Take of Nitrate of potass, ʒj.
Spirit of nitric ether, ʒij.
Tincture of digitalis, ʒiss.
Liquor of acetate of ammonia, ℥j.
Camphor mixture, ℥viss.

Mix, and give two table-spoonfuls every four hours.

Take of Tartar-emetic, ʒj.
Lard, ℥j.

Mix, and rub in a piece, of the size of a nutmeg, night and morning, until the peculiar pustules appear. *The diet* should be still low, but a little better than in the first stage.

(*c*) *In the third stage*, when there is either a gradual recovery, or else suppuration, or gangrene has taken place, the remedies must be apportioned to the condition which exists. If neither of the above results have shown themselves, it is only necessary to be very careful in allowing the *improvement in the diet*, which is required to support nature in her efforts. Sometimes, when there is very great exhaustion, small doses of ammonia will be beneficial, combined with some mild bitter, or with an expectorant, which will aid the secretion from the bronchial membrane, that is now often very profuse. At others, when there is a tendency to typhoid symptoms, a quinine and acid mixture will be of service; but on the whole there is great difficulty in laying down any rules for the management of this stage, which requires great tact and judgment. If matter forms, it must be suffered, and, indeed, if possible encouraged, to break, which it will generally do into the bronchial tubes; and then a large discharge of thick *pus* takes place, which will afterwards require the support of bark, and often ammonia and opium also, to carry the patient through.

(*d*) *In the convalescence* from this disease it is a long while before the lungs are sufficiently restored to a state of health to bear the strain of the increased circulation attending upon walking exercise, and great care must be exercised in this respect. The slightest exertion causes short and quick breathing, which will retard the progress to recovery, but ultimately this must be borne; and, therefore, as soon as it is believed that all mischief is at an end, in consequence of the pulse keeping quite steady, gentle walking exercise should be commenced, and very gradually increased in distance every day. By these means the important organs (the lungs) in time may recover their healthy structure, though it is seldom that hepatization is entirely removed, and there is almost always more or less dulness on striking the outside of the chest after an attack, however early in life it may have occurred.

1278. WHEN PNEUMONIA is developed at the same time with typhus fever, or small-pox, or measles, or any other fever, the treatment must be conducted on the same plan as is described above for simple pneumonia, modified, of course, according to the nature of the complication.

1279. PNEUMONIA, WHEN COMBINED WITH BRONCHITIS, which is almost always the case more or less, must be treated without reference to the latter disease.

1280. WHEN THERE IS PLEURISY combined with pneumonia, the treatment must be the same as for the latter alone, excepting that the calomel and opium must be more freely employed, and blisters and other counter-irritants will not be borne, because the inflammation produced by them extends to the pleura, and does harm rather than good. Leeching must, therefore, be substituted for them, and the subsequent application of a large linseed-meal poultice, covering the whole chest or the side affected, if confined to one half of the chest, will afford some relief. Spongio-piline may also be substituted for the poultice, used with warm water alone.

1281. CHRONIC PNEUMONIA, excepting as the sequel to the acute form, is very rare indeed, if it does occur at all. It is, therefore, useless to describe the proper treatment for it, especially as its existence can scarcely be discovered without the aid of the stethoscope in skilful hands, or of percussion, which is equally difficult.

CHAP. XII.

TREATMENT OF CONGESTION AND INFLAMMATION OF THE SEROUS MEMBRANES.

SECT. 1.—GENERAL PRINCIPLES OF TREATMENT.

1282. As all the serous membranes are closed sacs or bags, whenever congestion or inflammation goes to the extent of pouring out serum, pus, lymph, or blood, the fluid or substance secreted is contained within the sac, and nature has hard work to get rid of it; for even when it is filled with matter, there is no tendency to discharge the contents by ulceration of the membrane, and they either remain until death is produced by irritative fever, or they are re-absorbed into the blood, or they are evacuated by art. When lymph is thrown out it soon becomes organized, and glues the sides of the sac together, so that the natural use of the smooth surface is lost. Thus, after inflammation of the pericardium (the bag in which the heart is allowed free motion), the two surfaces become more or less completely united together; and though this organ is not thereby prevented from doing its ordinary work, yet when specially wanted for unusual occasions, it is tied down and confined, and fails in carrying on the circulation. So also with the pleura, which is frequently found to show traces of previous attacks of inflammation, in the shape of old adhesions between its two surfaces. These, however, by constant use generally become lengthened, and do not then interfere with the action of the lungs; but in very bad cases the lung is glued to the walls of the chest, and free respiration on any sudden emergency is considerably impeded. From these results of serous inflammation it is very important to stop it at once when it occurs, especially as it also is found to be a very fatal disease, if it once is thoroughly established, whether occurring in the chest or abdomen. The chief remedies are blood-letting and calomel and opium, followed by iodine, tartar-emetic, and diaphoretics, for the purpose of effecting absorption.

SECT. 2.—TREATMENT OF PLEURISY AND SEROUS PERICARDITIS.

1283. ACUTE PLEURISY (page 79) demands the most active treatment, and in almost all cases blood must be taken in large quantities, with a full stream, and to such an extent as to produce fainting. Immediately after this from five to ten grains of calomel should be given, and two hours afterwards a saline aperient, which will produce a large quantity of watery discharge from the bowels, and thus relieve the circulation.

Take of Sulphate of magnesia, ʒiij.
Powdered jalap, gr. x.
Infusion of senna, ℥j.
Tincture of senna, ʒij.
Peppermint water, ℥ss.

Mix, and form a draught. As soon as this has acted once, a pill of calomel and opium should be given every four hours, until the gums are affected, when it must be discontinued either in part or altogether, according to the extent of the mercurial action.

Take of Calomel, gr. j.
Purified opium, gr. ss to j.
Confection, to make a pill.

When it is no longer advisable to give calomel, it will be necessary to act upon the skin and kidneys by means of very small doses of tartar-emetic, combined with digitalis and other diuretics. Thus—

Take of Tartar-emetic, gr. j.
Tincture of digitalis, ʒj.
Spirit of nitric ether, ʒiij.
Nitrate of potass, ʒj.
Camphor mixture, ℥viiss.

Mix, and give two table-spoonfuls every four hours. During the first few days, if the pain and other marks of inflammation continue, leeches may be applied again and again to the chest, or a second bleeding from the arm may be practised, but afterwards the loss of blood will seldom be advantageous, and dependence must be placed upon the medicines employed, as already described. The *diet* should be of the most spare kind; nothing but slops being allowed, and of them as little as will suffice to keep body and soul together.

1284. IN ORDER TO GET RID OF THE EFFECTS of pleurisy, when serum has been effused into the chest, or adhesions have been formed, or matter has been effused, it is either necessary to adopt strong measures, by which the absorbents shall be roused into extraordinary activity; or, in the case of serum and matter, they may be let out by an opening made between the ribs. This operation, however, is quite beyond the reach of any but a surgeon, and may, therefore, be dismissed from our consideration. The medicines which are likely to have the effect are those which act strongly upon the bowels and kidneys, producing a great drain upon the blood, so that, in order to make up the loss, the vessels absorb the serum, and to a certain extent the matter also, but this last object can only be effected when the fluid is in small quantities. The following formulas may be useful for this purpose:—

Take of Acetate of potass, ℥ss.
Spirit of nitric ether, ʒiij.
Nitrate of potass, ʒj.
Tincture of squills, ʒij.
Spearmint water, ℥vij.

Mix, and give two table-spoonfuls three times a day;

Or, take of—
Comp. squill pill, ʒj.
Powdered digitalis, gr. j.
Iodide of potassium, ʒss.

Mix, and divide into twenty pills, one of which is to be given every six hours.

1285. FOR THE TREATMENT OF PLEURISY, COMBINED WITH PNEUMONIA, see page 408.

1286. CHRONIC PLEURISY (page 80) comes on most insidiously, and has often proceeded to the extent of producing effusion of serum before its presence is recognised, or any treatment adopted. When it is the result of the acute form, the remedies to be employed are those enumerated in par. 1283; and even when it comes on as a distinct disease, without any previous active stage, it must be met by almost the same remedies in small doses. Bleeding from the arm is rarely required, but leeches may be applied again and again with advantage, if the system is not too low. Calomel and opium should be persevered in for some time; and in this stage blisters may be employed without risk of incurring mischief, which, indeed, would be relieved, rather than otherwise, by a *slight* stimulus to more active inflammation, such as is afforded by them. In addition to the calomel and opium, which must be pushed as far as the system will allow, the mixture given at par. 1283 will be serviceable, and when the secretions have been fully established, and the strength is a good deal impaired, the iodide of potassium and sarsaparilla will often act most beneficially.

Take of Iodide of potassium, ʒj.
Spirit of nitric ether, ʒiij.
Acetate of potass, ℥ss.
Compound essence of sarsaparilla, ℥j.
Water, ℥vj.

Mix, and give two table-spoonfuls three times a day. The *diet* in chronic pleurisy must not be too low, but should be composed of a moderate allowance of farinaceous articles, made with a small addition of milk to the water used in them. Light broths, such as chicken or veal broth, may also be used. No fermented liquors will be safe.

1287. PLEURODYNIA, or *muscular pain in the side* (see par. 243), being of the nature of muscular rheumatism, must be treated on the principles which will be applicable to that disease, as laid down in the next chapter.

1288. IN SEROUS PERICARDITIS (see page 81), whenever there is reason to believe that the inflammation is confined to the serous coat, and does not extend to the fibrous pericardium, the treatment must be exactly on the same plan as for pleurisy; and if it is followed by effusion into the sac of the pericardium, the remedies applied should also be those which have been described as applicable to the removal of *water from the chest.* But the difficulty of diagnosis is so great, that it is scarcely probable that any unprofessional person could arrive at any conclusions which would safely allow him to undertake the management of such a case, and, therefore, it is quite useless to enlarge upon the treatment. If such an event should occur, as the necessity for doing the best under circumstances in which no medical aid can be obtained, it will be sufficient to follow out the directions given for pleurisy in pars. 1283, 1284, and 1286.

SECT. 3.—PERITONEAL INFLAMMATIONS.

1289. THE TREATMENT OF ACUTE PERITONITIS IN THE CHILD has been included under diseases of that age at page 315.

1290. ACUTE PERITONITIS IN THE ADULT, as described at page 82, must be treated according to the following indications, which are—1st, to lower the action of the heart, and remove the excess of fibrine in the blood; 2nd, to allay local irritation, and to avoid irritating the mucous membrane of the bowels; 3rd, to restore a healthy secretion of bile and mucus, and thereby re-establish the regular action of the muscular coat of the intestines. In carrying these out, it will generally be needful to take blood, either from the arm, or by the application of leeches, or both, and often in large quantities so as to produce fainting. After this, a full dose of calomel and opium should be given, followed by smaller ones of the same remedies. The first should be at least five grains of calomel and one of opium; while afterwards one grain of calomel and half a grain of opium, at intervals of four hours, may be considered sufficient. Long-continued fomentations of warm water afford great relief, or the hip-bath (at a temperature of 1008, which must be maintained for the whole time that it is used) will be still better when there are facilities for its employment. At first blisters are not allowable; but as soon as the most active stage is gone by they afford great relief, and should be used of sufficient size. They should not be irritated by any attempt to keep up the discharge, but should be dressed in the most simple way, and, for this purpose, there is no better application than a poultice of bread or linseed, which in itself is very useful, acting as a kind of fomentation, and encouraging the flow of blood into the skin. If the bowels are not pretty fully relieved after a few doses of the calomel and opium, about half an ounce, or if necessary more, of castor-oil should be given, and if this does not readily act, before repeating it an enema of gruel containing an ounce of castor-oil should be thrown up. Strong purgation should especially be avoided; but at the same time it is desirable to avoid costiveness, and if possible the happy mean between the two should be achieved. If there is any sickness, it may be allayed by the simple effervescent mixture given at page 342, or sometimes, if this fails, the hydrocyanic-acid mixture (page 345) will act as a sedative to the stomach, and may be tried concurrently with the calomel and opium. The *diet* should be of the most mild and unirritating kind, consisting chiefly of gruel or arrowroot; or, in the latter stages, veal or chicken broth will be found advantageous.

1291. IF RESOLUTION does not at once occur, and there is great exhaustion from the active treatment necessarily employed, as well as from the effects of the disease itself, it will be desirable to adopt different measures. In this case there is generally a great windy swelling of the abdomen (*tympanitis,* see page 82), which in most cases may be relieved by stimulating injections of turpentine and asafœtida (see page 344), together with the exhibition by the mouth of the following draught:—

Take of Wine of aloes, ʒj.
Tincture of henbane, ʒss.
Peppermint water, ℥j.

Mix, and give every six hours. If

there is effusion of lymph, pus, or blood, it will generally be necessary to keep up the strength by means of bark and ammonia, combined with opium.

Take of Decoction of bark, ℥xj.
Tincture of opium, ʒiss.
Sal-volatile, ʒss.

Mix, and give three table-spoonfuls every six hours. Here, however, the state of the patient is so precarious, that it is to be hoped there is seldom a necessity for his domestic treatment.

1292. IN ORDER TO RE-ESTABLISH THE SECRETIONS which have been deranged in this disease, it will generally be necessary to give some mild stomachic, such as rhubarb, and gentian, or cherayta, or cascarilla, with an alkali, and at the same time to attend most rigorously to the *diet*, which for a long time must be confined to the most digestible articles, such as chicken, white fish, and plain roast or boiled meats. The following formula will often act usefully on the debilitated mucous membrane:—

Take of Liquor of potass, ʒj.
Ipecacuanha wine, ʒj.
Spirit of nitric ether, ʒij.
Infusion of rhubarb, ℥iss.
Infusion of cherayta, ℥vj.

Mix, and give two table-spoonfuls three times a day.

1293. CHRONIC PERITONITIS (page 83) is seldom recognised in the adult until its most common sequel (effusion of serum) has shown itself in the form of dropsy of the belly (ascites), and in this condition the local inflammation has nearly passed away, so that our attention must be directed to the removal of the fluid, as well as to that of the disease which caused it. It is, therefore, desirable to combine with the calomel, which will reduce the inflammation, some diuretic to act upon the kidneys, and thus promote the absorption of the serum. If there is still tenderness of the abdomen, leeches may be applied, and after them a large blister will often aid in the reduction of the cause, but, at the same time, the following pills and mixture may be relied on to get rid of the effect:—

Take of Calomel, gr. viij.
Powder of digitalis, gr. j.
Compound squill pill, ʒss.

Mix, and divide into sixteen pills, of which one is to be given every six hours, with a dose of the following mixture:—

Take of Acetate of potass, ℥ss.
Spirit of nitric ether, ʒiij.
Infusion of horse-radish, ℥vij.

Mix, and give two table-spoonfuls with the above pill.

1294. ENTERITIS in the infant and young child is to be treated like gastritis (see page 305); the one almost always accompanying the other.

1295. ACUTE ENTERITIS IN THE ADULT (the symptoms of which are given at page 84) is to be met with very nearly the same treatment as that laid down in par. 1290 for peritonitis, the two generally running one into the other. The chief difference is that, in enteritis, bleeding must not be carried so far, and the local abstraction of blood by leeches is better than general bleeding. There is also a greater necessity for astringents, in case diarrhœa comes on; but, in all other respects, the remarks made at page 411, are applicable to the treatment of this disease.

SECT. 4.—INFLAMMATION OF THE SYNOVIAL CAPSULES.

1296. IN ALL ACUTE INFLAMMATIONS OF THE SYNOVIAL CAPSULES, when the joint implicated is a large and important one, active measures must be adopted, consisting in local, and even general, blood-letting, and the administration of tartar-emetic and calomel; indeed, the same plans which have been described as suitable to peritonitis and pleurisy are here also applicable. It is, however, somewhat rare to meet with the disease distinct from acute rheumatism, and it is also rather difficult to distinguish between the two, so that it is unnecessary to describe the treatment of this disease more minutely.

1297. IN CHRONIC INFLAMMATION OF THE CAPSULES OF JOINTS, which is chiefly known by the collection of fluid in them, the most important part is to get rid of that result of the inflammation by using small doses of calomel, combined with diuretics, and soon followed by iodide of potassium. Thus it will be necessary to begin by applying leeches to the part if there is any tenderness, and at the same time to give calomel, digitalis, and squill, until the mouth is slightly affected, in the same dose as is ordered at par. 1293. Afterwards the following mixture may be given for some little time, and the iodide of mercury may be rubbed into the joint in the form of an ointment as subjoined:—

Take of Iodide of potassium, ʒj.
Spirit of nitric ether, ʒiij.
Infusion of horse-radish, ℥viiss.
Mix, and give two table-spoonfuls three times a day.

Take of Iodide of mercury, ʒj.
Lard, ℥j.
Mix, and rub in a drachm every morning.

1298. WHEN PURULENT MATTER IS EFFUSED in the interior of a joint, it is sometimes necessary to let it out artificially; but the diagnosis is too obscure for any one but the surgeon to act upon his opinion in such an important matter.

1299. IN ALL CUTS, OR OTHER WOUNDS OF JOINTS, in which the lining membrane is injured, the first and most essential point is to give the joint absolute rest, and to close the opening, if it is a clean cut, by means of soap-plaster or diachylon, or by applying a bandage, loosely, dipped in the blood of the wound, and then keeping it constantly wet, either with cold water or with the irrigating process, described at page 265. This is certainly by far the most successful method of keeping down inflammation, and by its means I have succeeded in warding off its attacks from injured limbs, which by other means would have most probably become stiff joints under any other treatment. At the same time four grains of calomel should be given, and followed by an active aperient draught, so as to reduce the tendency to general fever which is so apt to supervene. If in spite of this it should come on, it must be kept under by the use of small doses of calomel and opium, or by giving tartar-emetic in the dose of one quarter or one-eighth of a grain. The prescriptions given under the head of *Pleurisy* will be applicable in these accidents; and the *diet* should be of the most rigidly abstemious kind, being confined to the thinnest and poorest slops.

CHAP. XIII.

THE TREATMENT OF FIBROUS AND MUSCULAR INFLAMMATIONS.

SECT. 1.—TREATMENT OF GOUT.

1300. IN THE TREATMENT OF GENUINE GOUT, as described at page 87, it must be remembered that it is a disease of the blood, showing itself in occasional paroxysms of inflammation of a joint, generally that of the great toe, or sometimes attacking an internal and more vital organ. Hence the indications which are to guide us may be considered to be twofold, depending upon the presence or absence of the paroxysm at the time of the commencement of the treatment.

(*a*) *If a paroxysm of gout* is present, it must be subdued by general and local remedies, proportioned to its severity. Thus, if there is very great inflammation in a joint, leeches may be applied in considerable numbers; but it is very doubtful whether they do not increase the tendency to a return of the paroxysm at some future period. Unless, therefore, the pain is very intense, they are better avoided. Nothing gives greater relief than a warm fomentation, made by boiling four bruised poppy-heads in a quart of water, and straining the liquor, which is to be used as hot as it can be borne, with the addition to it of two drachms of tincture of arnica. The fomentation may be repeated every four hours, and in the intervals the limb may be wrapped up in carded cotton, covered with oiled silk, which keeps it warm, yet moist, and often in itself affords great relief. For internal remedies, colchicum and opium with calomel are to be chiefly relied on, or the two first with magnesia instead of calomel, in either of the following formulas:—

Take of Powdered colchicum root, gr. v.
,, opium, gr. ss to gr. j.
Calomel, gr. ss.
Confection, to make a pill,

which is to be given every four hours;

Or, take of—
Wine of colchicum, ʒij to ʒiij.
Sulphate of magnesia, ℥ss.
Solution of carbonate of magnesia, ℥j.
Laudanum, ʒj.
Camphor mixture, ℥vj.

Mix, and give two table-spoonfuls every four hours. During the existence of the paroxysm the inflamed joint must be rested completely, and the *diet* should be of the most lowering kind, consisting entirely of slops. If the bowels are not freely moved, an active aperient should be administered, and repeated if necessary.

(*b*) *In the absence of the paroxysm* the gouty diathesis must be relieved, and, if possible, removed, by the strict adoption of temperate living, united with as severe exercise as the impaired constitution and the affected joints will permit. If the treatment is undertaken after a first fit of gout, and in a tolerably healthy person it will be practicable for him to take a large amount of walking exercise; but, on the other hand, when several successive paroxysms have rendered one or more joints weak and easily inflamed, while the constitution has been broken down by excess in living, and by the frequent use of colchicum, a very short walk will be too great an exertion, and it is almost a hopeless task in confirmed cases to attempt their relief by these means. Still, by great caution and proceeding slowly from one step gained to the next, it is astonishing what may be done; but it is seldom that the patient himself has the resolution to carry out what is necessary, and after a short trial gives the plan up in despair. Horse-exercise is borne much better because the strain is not so great upon the foot, which is the usual seat of the disease; but the worst of this kind is, that it increases the appetite for food without producing a corresponding waste of the solids and fluids of the body. Unless, therefore, there is sufficient self-denial in the patient to bear the hunger which it causes, without gratifying it with animal food and fermented liquors, it may better be omitted; but if he can suffer these disagreeable wants, it will be of the greatest service in the early stages of recovery, adopting it only as a preparation for walking. Until sufficient exercise can be taken, the blood must be reduced in its inflammatory qualities, by the occasional use of aperients, of which rhubarb and magnesia appear to be the best for the purpose. Occasionally a brisk mercurial aperient may be adopted, consisting of five grains of calomel at night, and a black draught the next morning (page 348), or the still more powerful draught given below it in the same page. If the stomach is much out of order, medicines adapted to give tone to it may be systematically employed, such as the restorative mixtures at page 342. The *solvent* restorative (page 342) will aid greatly in reducing the blood to a healthy state; but it does not always agree with the stomach. Nothing seems to exercise so great a power over the peculiar condition of the blood in gout as fresh lemon-juice, which should be given every two hours, in doses of a table-spoonful of the neat juice, and continued for at least a week or ten days, after which some stomachic medicine (page 342) may be given for a like period, and then the lemon-juice again for a week. But the great object in this diathesis is to strengthen the functions of the stomach, so as to obtain a healthy supply of well-digested chyle for the blood, and to keep down the quantity of this to the exact wants of the system, which will vary according to the waste produced by exercise of body and mind.

(c) *Where low gout* exists the treatment must not consist in the same application of lowering remedies, as are advocated above. Here the constitution is so broken up, that it cannot bear them, and, on the other hand, it will be often right to give ammonia, bark, iron, and wine. There is, however, too much obscurity in the diagnosis, and in the apportionment of remedies fit for the disease, to render any attempt at a description of them at all useful here.

SECT. 2.—RHEUMATISM.

1301. In the same way as in the disease known as *gout*, so also in that called *rheumatism*, there is a distinction in the treatment to be employed between that adopted for the diathesis, and that which will remove the paroxysm. It will therefore be necessary to consider the treatment of—1st, *the rheumatic diathesis;* 2nd, *acute articular rheumatism;* 3rd, *chronic articular rheumatism;* and 4th, *muscular rheumatism, both acute and chronic.*

(*a*) *The rheumatic diathesis* (see page 88) must be relieved by the adoption of the same measures as have been advised for gout, see par. 1300 *b*. These must, as there remarked, be employed during the intervals of the paroxysms, or, in chronic rheumatism, concurrently with the course of the disease, when, in fact, they will form a part of the plan recommended for adoption.

(*b*) *In acute articular rheumatism*, or *rheumatic fever*, or *rheumatic gout* (see page 270), there is a great choice of remedies, each of which has been found successful in the hands of certain practitioners, and is, therefore, advocated by them. The fact is, that the disease is an effort of nature to get rid of the poison (whatever it may be) existing in the blood, and, in course of time, works its own cure, so that the remedy often gets credit for which it does not deserve, and which really belongs to Dame Nature herself. Calomel and opium, nitrate of potass in large doses, tartar-emetic and opium, colchicum, lemon-juice, and some other remedies, will all sometimes appear to cut short the attack, and, I believe, they really have that effect, though there are some cases in which nothing seems to do it much good, and the disease will run its course of six weeks' duration. Still, in the majority of instances, it is possible, by means of one or other of the above remedies, to prevent that effusion of lymph around the joints which destroys their efficiency in the interval of the attacks, and prevents exercise being taken to a sufficient extent to ward off subsequent ones. If there is a very strong and bounding pulse, it is sometimes prudent to take away a pint of blood, if the patient is plethoric; but generally it will be advisable to dispense with this operation altogether, and to rely upon such medicines as will serve to purify the blood without much reduction of strength, or abstracting its healthy particles. Leeches to the inflamed joints themselves are unquestionably injurious, inasmuch as they encourage the effusion of lymph, and have a great tendency to cripple them, so as to interfere with their action afterwards. The combination of calomel with colchicum, nitre, and opium, in cases where the inflammation runs high, appears to act most beneficially; while the lemon-juice may be tried in low and semi-acute attacks, where the heart and arteries are not acting powerfully, and where there is no great redness of the skin over the joints. The following pills and mixture may be given until the gums show evidence of the mercury bringing on salivation, when the calomel may be withdrawn and the mixture used by itself, adding five or ten drops of laudanum to each dose in lieu of the opium in the pills—

Take of Calomel, gr. viij.
Opium, gr. iv.
Confection, enough to make eight pills,

one of which is to be given every four hours.

Take of Nitrate of potass, ʒij.
Wine of colchicum, ʒij to ʒiij.
Syrup of poppies, ʒij.
Spirit of nitric ether, ʒiij.
Camphor mixture, ℥vij.

Mix, and give two table-spoonfuls with each pill, as above ordered. As local applications to the joints, nothing succeeds so well as the carded cotton covered over with oiled silk and a light bandage, which may be kept on day and night, and affords great relief from the severe pain experienced in this disease. The bowels should be kept freely open by means of an occasional aperient, such as either of those at page 348. With regard to *diet*, it must be of the most simple and lowering kind, consisting of farinaceous slops alone. When this treatment has been continued for some time, the disease gradually abates, and either ceases entirely, or leaves behind a chronic degree of inflammation, which must be treated according to the directions to be presently given.

(*c*) *Chronic rheumatism* (page 90), when it occurs as the sequel of the acute form may be left greatly to the efforts of nature, which in time will generally remove it. If, however, there appears to be no ground made, or if the disease has never been active, the iodide of potassium and sarsaparilla may be tried, or sometimes cinchona will rouse the vessels to proper action, or guaiacum. The compound powder of ipecacuanha given at night will afford sleep, and often produce perspiration, which gives a little relief. The following formulas may either of them be tried :—

Take of Iodide of potassium, ʒj to ʒiss.
Compound essence of sarsaparilla, ℥j.
Spirit of nitric ether, ʒss.
Camphor mixture, ℥viss.

Mix, and give two table-spoonfuls three times a day ;

Or, take of—
Mixture of guaiacum, ℥vij.
Compound tincture of camphor, ℥j.

Mix, and give two table-spoonfuls three times a day;

Or, take of—
Decoction of cinchona, ℥xij.
Diluted nitric acid,
,, hydrochloric acid, ā ʒj.

Mix, and give three table-spoonfuls three times a day. When the chronic form has been assumed from the first, it will often answer well to give lemon-juice in the doses mentioned at page 414, taking care to confine the patient as much as possible to bed, or to a warm room, and using local remedies at the same time. These may consist of the liniment of turpentine, which may be rubbed in night and morning; or it may be used in combination with the liniment of ammonia, in equal proportions; or the tincture of iodine may be painted over the rheumatic joint every other day. The hydropathic remedies are peculiarly applicable to this complaint, and have certainly gained a great proportion of the credit which they have received, from the result of their adoption in rheumatic cases of a chronic nature (see page 201).

(*d*) *Acute muscular rheumatism*, when it occurs on the surface of the body, or in the limbs, is not often of a very active or formidable character, and may be treated by attending to the general health, according to its state, and by the use of local remedies of a counter-irritating character. Nothing serves the latter purpose better than the following liniment, which may either be rubbed in, or used with spongio-piline (see page 264). It answers for *wry-neck*, or *lumbago*, and is very efficient also in *pleurodynia*; but when lumbago is very severe, colchicum and opium, sometimes united with calomel, must be given internally.

Take of Liquor of ammonia,
Tincture of opium,
Spirit of turpentine,
Olive-oil, equal quantities,

and rub into the part, or use with spongio-piline, in which latter case the quantity of ammonia must be reduced to one-half.

Take of Powdered colchicum-root, gr. ij to v.
Powdered opium, gr. ss to j.
„ rhubarb, gr. iij.

Mix, and give three times a day.

(*e*) *In acute muscular rheumatism*, attacking the heart, internal remedies, such as the above combination of colchicum and opium, will be necessary; and, in addition, the calomel must almost always be employed, together with counter-irritation by means of blisters, which must be repeated again and again until the disease is abated. It is, however, of so serious a nature that no time or efforts should be lost in obtaining medical aid.

(*f*) *Chronic muscular rheumatism* is a most intractable complaint, and can only be relieved by the use of any stimulating embrocation, such as that given above, or by vapour-baths or the hydropathic processes. The mixture of guaiacum with compound tincture of camphor (see page 416) will sometimes be of service internally, or the iodide of potassium with sarsaparilla (see page 416); but the great point is to attend to the diet, and give what exercise the body is capable of sustaining, increasing it most gradually until the full amount necessary to the cure is obtained.

SECT. 3.—TREATMENT OF MUSCULAR SPASMS.

1302. CRAMP (page 91) may, to a certain extent, be relieved by friction, and also by the forcible extension of the muscle in which the contraction exists. The constant wearing of a skein of silk around the limb has some slight effect in preventing the occurrence of cramp, probably from its electrical properties, and the low galvanic batteries, known as "galvanic rings, bracelets," &c., have a still greater power. Where there is a great tendency to cramp in the feet or legs, if they are soaked in very hot water, especially with the addition of half a pint of vinegar and two ounces of mustard, and then invested in flannel stockings, the tendency is very much lessened, though, in some obstinate cases, nothing seems of much use.

1303. COLIC (for the symptoms of which see page 91), as occurring in the child, is treated of at page 316.

(*a*) *Ordinary colic in the adult* is to be treated by first relieving the spasm, and then procuring a free evacuation from the bowels, which is almost impossible so long as the spasm continues. The combination of large doses of opium with a strong aperient seems to act in this disease most beneficially, and the following remedies may be adopted according to the severity of the symptoms, using the first for mild cases. At the same time the bowels may be well fomented with flannels wrung out in hot water, or a bladder of hot salt may be applied, or the liniment of turpentine may be rubbed in or applied on spongio-piline (see page 349). Before employing any of the following remedies, it is essential to make out clearly that there is no inflammation.

FORMULAS USEFUL IN COLIC:—

Take of Tincture of opium, min. xxv to xxx.
Tincture of rhubarb, ʒij.
Castor-oil, ʒiij to ʒv.

Mix, and give every three or four hours till it acts freely;

Or, take of—
Calomel, gr. iij.
Purified opium, gr. j.
Confection, to make a pill,

which may be repeated once or twice at intervals of two or three hours, and then followed by two table-spoonfuls of castor-oil; and this again may be given a second time at the end of six hours, if it has not acted when aided by an enema of gruel, &c.;

Or, take of—
Purified opium, gr. iv.
Extract of colocynth, gr. xij.
Croton-oil, min. iv.

Mix, and divide into four pills, one of which is to be taken every four or five hours, till the bowels are relieved. If the abdomen is very much distended with flatulence, several quarts of warm water may be thrown up into the rectum by means of the ordinary enema-syringe, which will seldom fail to afford relief, and to bring away large collections of wind which are so distressing in this complaint.

(*b*) *Painter's colic* is treated much on the same principles as the ordinary attack; but the remedies generally require to be more active, and it often demands very large doses of calomel and opium to reduce the spasm, as well as most powerful aperients to produce an action of the bowels. The croton-oil pills, the formula for which is given in the last paragraph, are very useful in this attack, as also is the injection of warm water; but it occurs so seldom in situations where medical relief is not available, that it is useless to dilate upon it more fully here.

(*c*) *Where intussusception* (par. 274) is suspected as a concomitant of colic, solid quicksilver has been tried as a remedy in doses of two or three drachms; but the diagnosis is beyond the power of the domestic observer.

1304. Hiccup (page 91), as generally occurring in young people, is treated of at page 316. When it makes its appearance in the last stages of exhausting diseases, it is merely a symptom, among many others, of the failing powers of the nervous system, and no special measures of relief should be attempted.

1305. Ordinary Spasm whenever occurring is most probably due to congestion of the vessels of the muscular fibres which are the seat of it, though the nerves are perhaps still more remotely at fault. In order to relieve the various kinds of spasm, the remedies must be suited to each, according to whether there is spasm with want of tone, as in dyspepsia, or the irregular spasm of hysteria, or the various forms which occurs in spasmodic asthma, spasmodic croup, &c. Colic is a spasm of the muscles of the bowels, while "the spasms," which name is used very commonly among unprofessional people, are seated in the muscular coat of the stomach. The remedy for this painful affection will depend very greatly upon the amount of dyspepsia present; for if the stomach is full of acid and badly digested food, unless this is removed, it is often useless to attempt to give relief. Therefore, in violent cases of spasm of the stomach, with habitual indigestion, if it is distended with food, the best remedy is a mild emetic, containing a few drops of laudanum, and followed by a warm mixture, as prescribed below:—

Take of Powdered ipecacuanha, gr. xx
    to xxv.
  Powdered opium, gr. ss to j.
Mix, and give as an emetic.

Take of Sulphuric ether,
  Sal-volatile, ā ʒiij.
  Tincture of opium, ʒj.
  Compound tincture of lavender, ℥ss.
  Camphor mixture, ℥viss.

Mix, and give two table-spoonfuls every two hours till relief is afforded. As soon as the pain is quite gone, a mild aperient will generally be useful, and the attention must be directed to prevent a return, by giving stomachics suited to the exact condition.

Sect. 4.—Treatment of Strains, Sprains, and Dislocations.

1306. Strains are mechanical injuries of muscles or tendons generally caused by violent exertions of them, and followed by inflammation, exhibiting the usual signs in the course of the muscle or sinew. The *treatment* consists in applying leeches directly over the swelling, and following their use by a cold-lotion made as directed below. The blood may be encouraged to flow by the use of flannel (see page 259), in preference to hot fomentations, and as soon as it ceases the lotion may at once be applied, or in slight cases it may be used without them.

Take of Tincture of arnica, ʒiss to ʒij.
  Liquor of acetate of lead, ʒj.
  Vinegar, ℥j.
  Water, ℥xj.

Mix, and use with pieces of linen frequently wetted and re-applied. When the heat has entirely left, and the inflammation seems subsided, though there is still swelling and stiffness, the following liniment may be rubbed in night and morning, but great care must be taken not to use it if the heat of the part is thereby restored to what it was when inflamed; or even if it is much aggravated and increased, it is better in such a case to wait a little longer, or to re-apply the lotion, as the liniment, instead of doing good, would only increase the effusion, and make it far more difficult to get rid of afterwards.

Take of Tincture of arnica, ʒiij.
Liquor of ammonia, ℥j.
Spirit of turpentine,
Soap liniment, ā ʒj.

Mix, and rub into the part night and morning, adding more soap liniment if it is too strong for the skin to bear.

1307. By the term Sprains, as contradistinguished from *strains*, is meant the mechanical injury of the ligaments of a joint, by which they are over-stretched, or sometimes actually torn asunder in part or entirely. It is unnecessary to enter upon a description of the symptoms of this accident, which are too well known to need it; but it may be useful to remark, that every mechanical injury not being an actual blow or crushing of a joint, in which there is no dislocation or fracture, is "a sprain" in ordinary language. It is, therefore, only necessary to ascertain that neither of the above complications exist, and the accident may then be at once considered to be a sprain. The great point of distinction is, that in both fractures and dislocations, especially in the latter, there is considerable distortion; while in fracture there is the symptom known as "crepitus" (see *Fracture* in next chapter). In sprains we often see some *apparent* distortion; but when the limb is closely examined, and the two corresponding extremities are compared together, it will be seen that it is confined to a swelling of the soft parts, and that the bones are still in their places. The *treatment* is very similar to that recommended for strains; but as the inflammation is generally more severe, so there is a greater necessity for leeching, and for cooling lotions, as well as sometimes for general antiphlogistic remedies (see page 342), including among them an active aperient to begin with. Entire rest of the sprained joint should be practised for a time, longer or shorter, according to the extent of the injury. As long as pain is experienced in using the limb, it may generally be assumed that it is unfit for it; but sometimes the suffering is occasioned by a want of support from the absence of the ligaments which have been torn, and then after applying a bandage, or some broad straps of soap-plaster, or strengthening plaster, the limb may be used, with care in avoiding all unnecessary action. Nothing answers better in such cases than the elastic socks, stockings, and knee-caps, which are now so generally employed for these and other similar defects; but they must not be commenced while there is the slightest heat remaining on the surface. If it is very important to attempt using a sprained joint while still inflamed, a calico bandage may be put on, so as to afford the necessary support, and then it may be kept thoroughly wet with the lotion which is prescribed under the head of *Strains*, page 418.

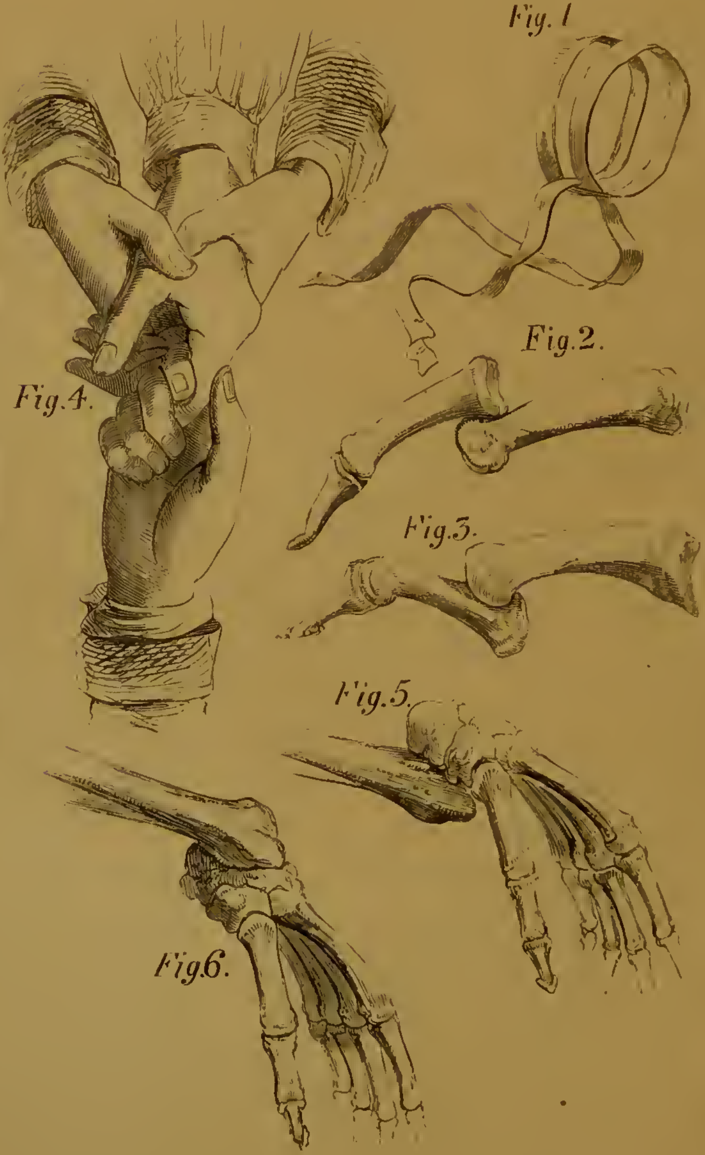
1308. The term Dislocation, or Luxation, is employed to signify the separation of the articular surfaces of two or more bones, either by accident or disease. The former of these conditions will be the only one necessary here, because a dislocation occurring as a consequence of disease is wholly beyond the reach of ordinary treatment, and may, therefore, be omitted from our examination.

(*a*) *With regard to dislocations the result of violence*, they may either be partial or complete; partial dislocations being those in which the two cartilaginous surfaces are still to some extent in apposition, while in complete dislocations they are totally separated from each other. In both of these the ligaments are more or less sprained, and there will be consequent severe inflammation; but there is another complication which increases this result to a most alarming degree, namely, when the soft coverings (skin, &c.) of the joint are torn, and the cavity is exposed to the air, which accident is called a *compound dislocation*, while in the absence of any such wound, it is termed a *simple dislocation.* Lastly, there may be at the same time a severe injury of the blood-vessels, or nerves, or of the bones themselves, which will still further increase the importance of the accident; but these do not give any distinct name to the dislocation, and the additional feature must be considered by itself, the treatment being modified as far as possible to suit the nature of the case.

(*b*) *The causes and symptoms* of the various dislocations depend greatly upon the nature of the joint implicated. In none can such an accident be produced without considerable violence, either external to the body from a heavy weight falling on it, or from its own weight falling on the ground, or contained within the body itself, as when a violent action of the muscles draws the head of a bone out of its socket, and so gives rise to a dislocation. But in order to understand the various dislocations, and to discover as well as treat them when they occur, a considerable knowledge of anatomy is required. Nevertheless, as such accidents often occur at a distance from surgical aid, and as delay aggravates the attendant mischief very materially, it is well to offer here such directions as may be of service to the unprofessional reader.

(*c*) *The diagnosis from fracture* is the most difficult task for the inexperienced observer; for though it is easy enough in all such accidents to see that there is considerable distortion, and that something is wrong, yet it is not always so clear what the nature of the injury is. Indeed sometimes the two are combined, as in what is called "Pott's fracture," when the bone of the leg is broken as well as dislocated at the ankle. In the shoulder-joint, as well as in the hip-joint, it is sometimes a difficult task to distinguish a dislocation from a fracture near the joint, as will be explained in describing the several injuries of these parts. But the existence of "crepitus" (see *Fractures*) will generally serve as a guide, if the examiner has obtained a knowledge of the peculiar noise which is called by that name; and if not, he can only make the best use of his faculties in arriving at a tolerably correct conclusion from the description. There is, moreover, a test which is more available, consisting in the fact, than in a fracture of a bone near a joint, the parts can be restored to a natural shape by a very slight extension, although they slip back on removing it; but in dislocation, if once they can be so restored, which usually requires great force, they remain in their proper position and the dislocation is "reduced," though still for some time liable to recur again on very slight provocation.

(*d*) *In treating all simple dislocations* little more is necessary than to reduce them as speedily as possible, after which the limb should be kept as quiet as possible; and, if there is much swelling and inflammation, it must be treated as for a sprain (see page 419). *If the dislocation is incapable of reduction* by the means at hand as applied by the unskilled operator, the best thing to be done is to keep it quiet, and treat it as an ordinary sprain until further assistance can be obtained, in which there should be as little delay as possible. *If the dislocation is compound,* and the wound is not very large, it may still possibly be reduced, and as long as there is no fingering of the wound, and the manipulation is confined to sound parts, the attempt may be made with safety. There is sometimes very great difficulty, even in the hands of a surgeon, in reducing a compound injury of this nature, as the head of the bone protrudes very considerably, and requires the union of great force and skill to bring it back into its place and retain it there. It is, therefore, hardly a case for unprofessional hands to attempt; and, excepting in extraordinary emergencies, it should be reserved for the surgeon at all hazards, and whatever distance



DISLOCATIONS.

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there may be to travel. In the meantime the wound should be dressed with wet lint, and kept wet, if possible, by covering the whole with oiled silk or some thin India-rubber or gutta-percha material. Great inflammation is sure to ensue, which must be kept down by general lowering measures, such as active aperients, and those fever medicines, which are ordered at page 342.

(e) *In attempting the reduction of a severe dislocation*, the operator often requires the aid of one or more assistants, and of bandages, or towels, to get a firm hold of the limb and body. Besides these aids, it is also requisite in severe cases (such as dislocations of the hip, &c.) to act upon the constitution in such a way as to remove the opposition offered by the strong muscles of the part. Chloroform is now employed by the surgeon to effect this object, which it does most completely; but as it is scarcely safe to be used by any other than a professional person, it may be well to know that a full dose of an emetic will materially aid the object in view, and this may be had recourse to in such an emergency, giving it so as to act just before the trial at reduction is made, and repeating it a second time if necessary. Bleeding from the arm to the extent of producing fainting may also be had recourse to in severe dislocations.

(*f*) *The principle of reduction in all dislocations* is the same, consisting in first fixing the part nearest the body, by the aid of some assistants, or by the heel of the operator in the armpit in one kind of dislocation of the shoulder. A towel or broad cloth is used for this purpose of fixing, or *counter-extension* as it is called, and the operator then drawing the limb away from the body in such a direction as to bring the dislocated bone over the joint which it has left, the muscles as soon as its head is beyond the edge of the cavity proper to it, draw it into its place, in which natural effort the fingers or hands of the operator will often be of great service in guiding it to its destination. In dislocations of the hip and shoulder, the strength of several men must often be employed, and the operator then only superintends the proper laying out of their power, and directs the head of the bone into its socket, as soon as the force is sufficient to bring it out of its unnatural bed.

1309. THE TREATMENT OF THE SEVERAL SPECIAL DISLOCATIONS is as follows, for which purpose the only mechanical aid that is likely to be at hand is the ordinary towel or cloth, made into a "clove-hitch" (see *fig.* 1). This is easily made, by first coiling it twice, and then slipping the upper fold beneath the lower one, after which the limb is passed through both, the ends are drawn tight, and the force employed in pulling at them drawing the folds tighter and tighter, the "hitch" never slips, and may be relied on as a most efficient means of retaining hold of a limb under all circumstances.

1310. DISLOCATIONS OF THE FINGERS AND THUMBS are common enough, and may be either upwards (see *fig.* 2) or downwards (see *fig.* 3), in which the bones only are shown to make the displacement more clear. These are sometimes described, also, as backwards and forwards in lieu of upwards and downwards. The lateral dislocation is so rare as to require no consideration here. The *reduction* is effected by grasping the finger or thumb close to the dislocation (see *fig.* 4), while the hand is held by an assistant; and then, while making strong extension, the bone is gradually drawn into its socket. In *dislocation* of the first joint of the thumb upwards (or backwards) as in *fig.* 3, there is great difficulty in effecting its replacement, and, in fact, it is sometimes impossible by any ordinary means. When much difficulty is experienced here or in any other joint of the hand, the clove-hitch (see par. 1309) should be applied to the finger or thumb by means of a thin silk handkerchief or soft bandage, and then extension may be managed by giving its ends to one person to pull at while another fixes the hand, and the operator endeavours by means of his fingers and thumb to press the bone (after extension has been kept up for some time) into its place.

1311. DISLOCATION OF THE WRIST

may be either backwards or forwards (see *figs.* 5 and 6) or very rarely laterally, so much so, indeed, as to be beyond the necessity for notice here. There is not often any great difficulty in detecting these dislocations; and they may be also readily reduced if the attempt is made soon after the accident. An assistant should grasp the fore-arm, while the operator lays hold of the hand, either in both of his, which is usually a sufficient purchase, or by means of the "clove-hitch" made in a soft silk handkerchief; then using a tolerable degree of extension for a few minutes, the reduction takes place without much guidance on the part of the operator, or if necessary, aided by the fingers pressing on the head of the dislocated bone.

1312. DISLOCATIONS AT THE ELBOW are very complicated, and also difficult to reduce when their nature is discovered. It must be remembered that there are here three bones entering into the composition of the joint, namely, the arm-bone (*humerus*), and the two bones of the fore-arm (*radius* and *ulna*). The radius may be dislocated by itself backwards or forwards, while the ulna may be dislocated also backwards, but not forwards, it carrying the radius with it. There are, besides these, two lateral displacements of the bones of the fore-arm, and lastly, a very rare dislocation has been met with in which the cartilaginous surface of the humerus rests between the radius and ulna; but this occurs so seldom as to be beyond the scope of the present volume.

(*a*) *In dislocation of the radius forwards* (see *fig.* 7) it is of no use attempting extension, because it would not act until the ulna also has been drawn out of its socket, which would be making matters worse. The only plan, therefore, consists in forcibly pressing the head of the bone into its socket; but this is not a very easy matter, and, if it is left alone, the inconvenience is not very great.

(*b*) *When the radius is dislocated backward*, the appearance is as shown at *fig.* 8. Here the reduction, if it is to be accomplished, must be effected on the same principle as in the forward dislocation of the same bone, avoiding extension for the same reason.

(*c*) *In dislocation of the ulna backwards* (fig. 9), which is the most common of all those occurring at the elbow, the unnatural prominence before and behind the joint, its immobility, and the hollow above the point of the elbow, sufficiently indicate its nature. *The proper mode of reduction* is to bend the joint, and at the same time to use considerable force in drawing the fore-arm from the arm, while the flexion must be much more gentle. By this combined action there is seldom much difficulty in replacing the bones in their proper situations.

(*d*) *An indefinite number of dislocations* may be mentioned as having been met with, when complicated with slight fracture of the bony processes about this joint; but it is useless to attempt to describe them or their treatment on account of their excessive rarity.

1313. DISLOCATIONS OF THE SHOULDER are generally downwards or forwards, on account of the trifling amount of protection afforded in that direction to the cavity or cup in which the head of the arm-bone lies. There is also a third kind, but the first of these is far the most frequent of all, next to which comes the second, and then the dislocation backwards, the head of the bone lying behind the shoulder blade (see *figs.* 10, 11, and 12).

(*a*) *In dislocation downwards, or into the arm-pit* (*fig.* 10), the accident can scarcely be mistaken. The symptoms are a painful large swelling in the arm-pit, with a hollow below the front of the shoulder, as seen in *fig.* 13. The arm lies immoveable, and the elbow cannot by any means be raised to the level of the shoulder, nor can it without great pain and force be brought close to the side. The fingers are numb, and the hand generally swells considerably; but the above signs are sufficient to distinguish this accident. The mode of *reduction* in recent cases is—first, to fix the body *together with the shoulder-blade* by cutting a slit in a jack-towel large enough for the arm to pass through, and after

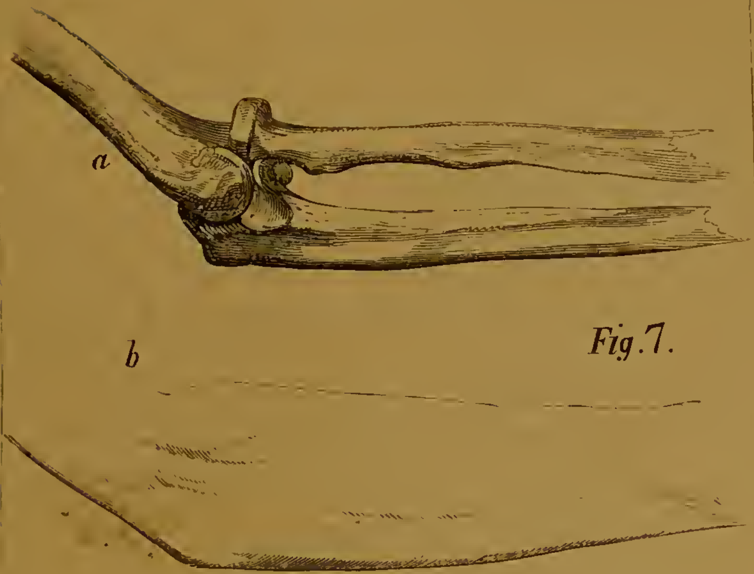


Fig. 7.

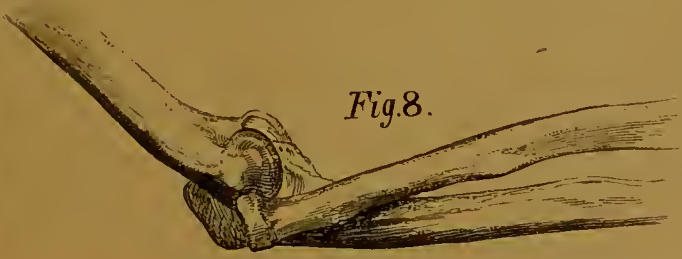


Fig. 8.

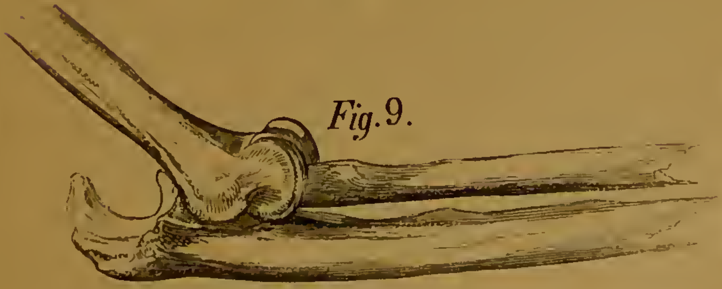
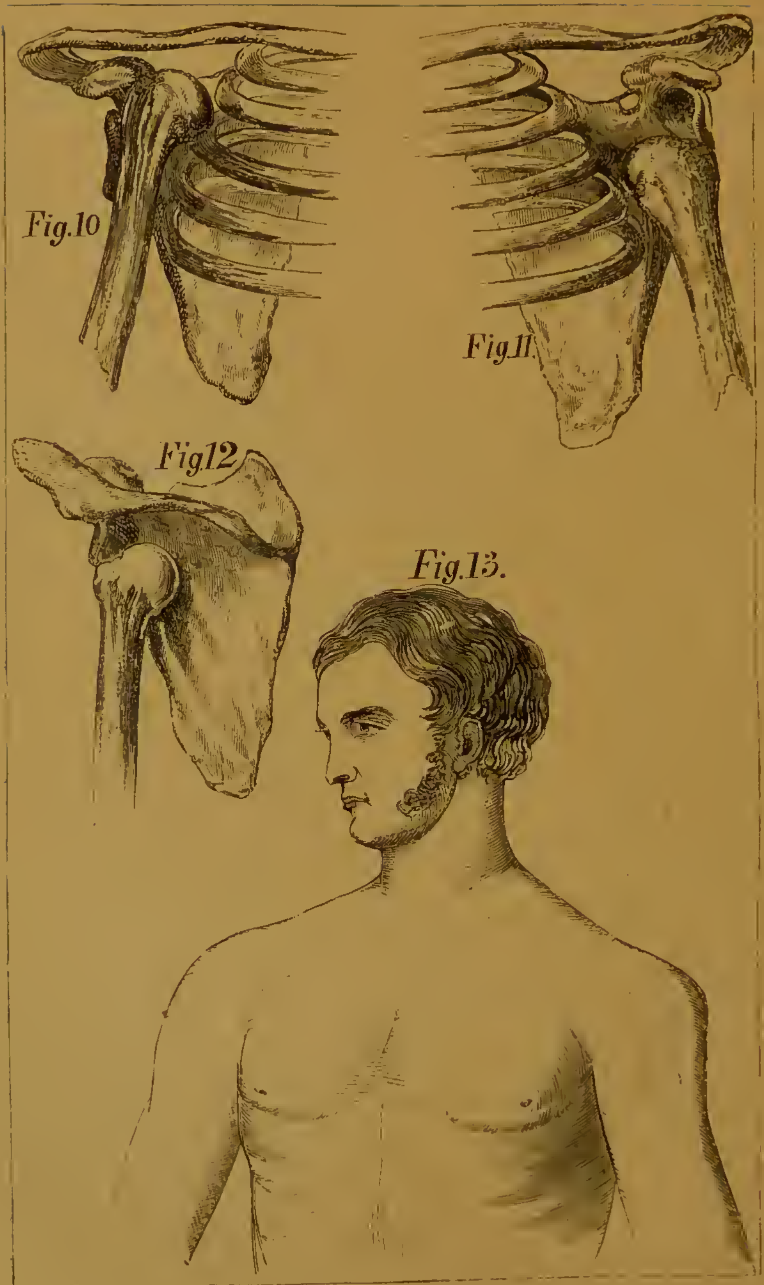


Fig. 9.

DISLOCATIONS OF THE ELBOW.

P. 122.



DISLOCATIONS OF THE SHOULDER.

P. 423.

Fig. 14.

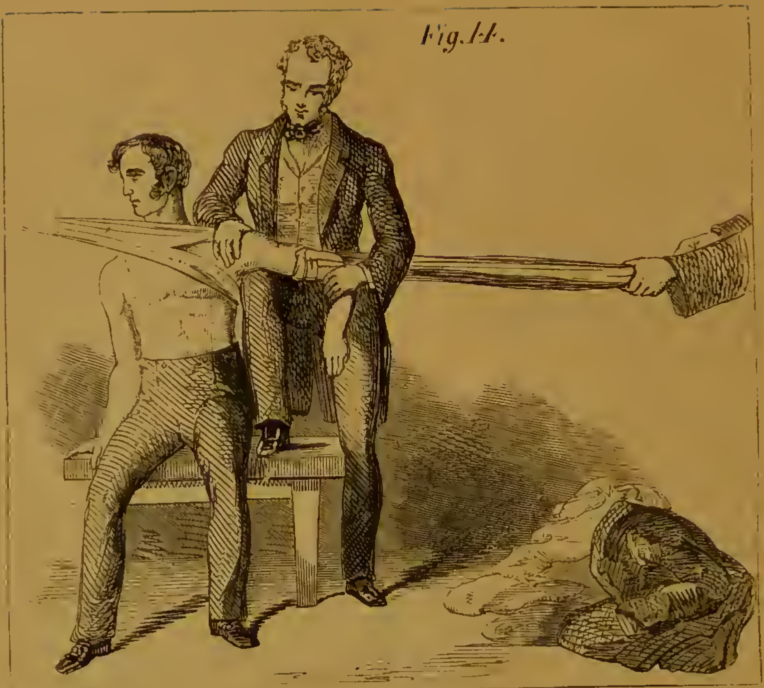
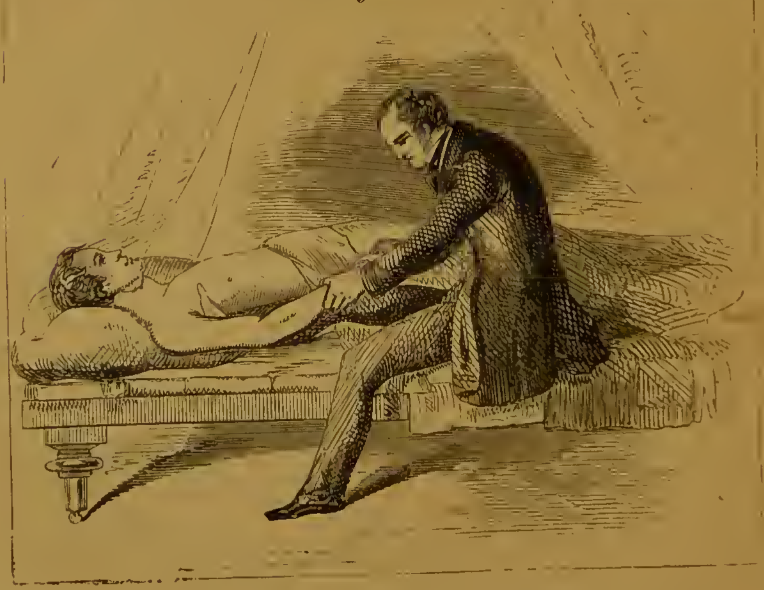


Fig. 15.



REDUCTION OF DISLOCATIONS OF THE SHOULDER. P. 423.

doing this, to bring the towel, one part before and the other behind the body, and fasten it to some fixed and firm support, such as a strong stick thrown across an open door, which answers the purpose exceedingly well. Having done this, another towel is to be made into a "clove-hitch" (see par. 1309), and slipped over the elbow on to the arm, when the ends are to be firmly drawn, and given to two or three strong persons, who must use a very steady extension for some minutes, in the direction shown at *fig.* 14. It is very important that the force exerted should be steady, and not in jerks; and if the parties using it will throw their weight into the pull, and not allow their muscles to act much beyond this, they will do far more good, and there will be greater probability of the dislocation yielding. The operator stands as shown in the figure, with his knee beneath the arm; and towards the last he endeavours, by using it as a fulcrum, and depressing the elbow, which acts as a lever, to raise the head of the bone into its place. At the end of ten minutes or a quarter of an hour, if this plan is pursued, the bone slips in with a snap, and the force may be discontinued; but if this is not seen or heard, the assistants must be told to leave off suddenly, and the moment the arm is free, it must be brought with some force to the side, and this seldom fails if the former plan has been unsuccessful. Besides this mode, another is sometimes adopted, consisting in making both the extension and counter-extension by one person (the operator) who places the patient on a sofa (see *fig.* 15), and then after having applied the "clove-hitch" to the arm, he fixes the sole of his foot, without a shoe, in the arm-pit, and pushes the bone back into its place, at the same time that he makes extension with the towel. This plan, however, is scarcely applicable to any but a female, or a man of less than the average muscular power.

(*b*) *In dislocation forwards* (see *fig.* 11), the head of the bone lies beneath the pectoral muscle, and a swelling is felt there, while the arm-pit is very little more prominent than usual. There is considerable flatness beneath the point of the shoulder, but not so great as in the dislocation already described. The mode of *reduction* is confined to the former of the two methods indicated above, the second not being so applicable, inasmuch as the head of the bone is already nearly on a level with the cavity it is to be drawn into.

(*c*) *Dislocation backwards* (*fig.* 12), though rather a rare accident, does occur occasionally, and may be known by the same flatness of the outside of the shoulder, and incapability of moving it, and by the swelling at the back of the shoulder-blade. Here either of the plans mentioned may be adopted, the choice depending upon the muscular power of the patient, and also partly upon that of the operator and the presence or absence of handy assistants.

(*d*) *When a dislocation of the shoulder has been reduced*, it is always prudent to confine the arm to the side by a bandage round the waist for some days, as it is very apt to be thrown out again on the slightest attempt at using it.

(*e*) *Dislocations of the shoulder may be distinguished* from fracture of the neck of the scapula close to the joint, and by the absence of mobility, which in fractures is not much interfered with. In the latter, also, the joint can readily be restored to its usual form by very slight force, but again returns to its deformed appearance on removing the extending power.

1314. THE COLLAR-BONE MAY BE DISLOCATED at each end, but the case is too obscure and also too difficult to treat to be worth any remarks here. If it is suspected, a figure of 8 bandage should be kept on just as in fractured collar-bone, (see next chap.)

1315. DISLOCATIONS OF THE TOES are so rare and unimportant as to be unworthy any notice here.

1316. THE ASTRAGALUS, one of the bones of the instep or *tarsus*, is sometimes forced out of its place, but the case is beyond the power of unskilled art, and is better left alone until the assistance of a surgeon can be procured. Its nature may be detected by the occurrence after an accident of a hard bony tumour on the upper part of the instep with great pain, and soon followed by considerable inflammation, which may be treated in the same way as a sprain until a surgeon can be consulted.

1317. DISLOCATIONS OF THE ANKLE-JOINT are common enough, and are of four kinds—*inwards*, *outwards*, *backwards*, and *forwards*. In almost every case, however, there is a fracture either of the end of the fibula or of the tibia, the dislocations forwards and backwards being sometimes exceptions. The dislocation outward (*fig.* 16, *a* and *b*) is by far the most common, though it is generally distinguished as a fracture, receiving the name of "Pott's fracture," from the celebrated surgeon who drew particular attention to it. In this figure (*a*) shows the actual injury and displacement of the bones, while (*b*) gives the appearance during life while the dislocation is unreduced. *In reducing these dislocations*, extension is to be made with the foot at a right angle with the leg, when the bones seldom fail to enter their natural sockets. Afterwards the inflammation must be treated in the same way as for sprains, and the fracture must be kept in its place by a splint, on the plan which will be described under the section on *Fractures*.

1318. THE BONES FORMING THE KNEE-JOINT may be displaced in almost any direction, the thigh-bone coming backwards or forwards, or towards either side, and, in addition, the patella being dislocated sideways. The only difficulty in effecting a reduction in these cases arises from the great power of the muscles of the thigh, which are often spasmodically affected; and to meet this it is often necessary either to use chloroform or tartar-emetic (see page 421), after which, by a little steady extension, with the body in a sitting posture, the bones are soon replaced.

1319. THE HIP-JOINT is susceptible of four different kinds of dislocation, which require the reducing force to be exerted in as many various ways to effect the object, and consequently each must be separately described. They are—1st, *upwards on the back of the ilium*; 2nd, *backwards into the ischiatic notch*; 3rd, *downwards and forwards into the foramen ovale*; and 4th, *forwards upon the pubes* (see *figs.* 17, 18, and 19). No unprofessional person should attempt the reduction of this formidable dislocation if it is possible to obtain surgical aid; but to meet the emergency, which may occur among emigrants at a great distance from any settlement, a short description is here given for those who may prefer to make the attempt. It is seldom that sufficient force can be applied without the aid of a pully, unless chloroform is used, or large doses of tartar-emetic, and even then it would require several men to throw all their weight upon the towel in order to make sufficient extension.

(*a*) *The most common dislocation of the hip is that in which the head of the bone lies on the back of the ilium*, as seen in *fig.* 17, which shows the bones themselves (*a*), and the appearance during life (*b*). Here the dislocated limb will be found to be more or less shortened, on making the patient stand, and comparing the ankle-bones; the foot is turned in, and the great toe rests on the instep of the other foot. The knee is slightly bent, and the *whole limb is immoveably fixed*. There is a swelling at the hip, caused by the protrusion of the head of the thigh-bone. The *treatment* consists in first weakening the muscular power either by chloroform, or if that is not available, by a copious bleeding, followed by half a grain of tartar-emetic every ten minutes until nausea is produced. The patient should be on his back, with a towel passed between the legs and brought round the hip, so as to fix the body by attaching it to some firm support, such as the stick passed across a door, as described at par. 1313 *a*. A towel is then applied to the thigh by the clove-hitch (see par. 1309); and then three or four strong men being put to pull at it in the direction shown in the annexed cut (*fig.* 17 *c*), after a quarter of an hour's steady strain upon the muscles, it may be hoped that the joint will be found to glide into its place with a snap. If it cannot be reduced by this method.

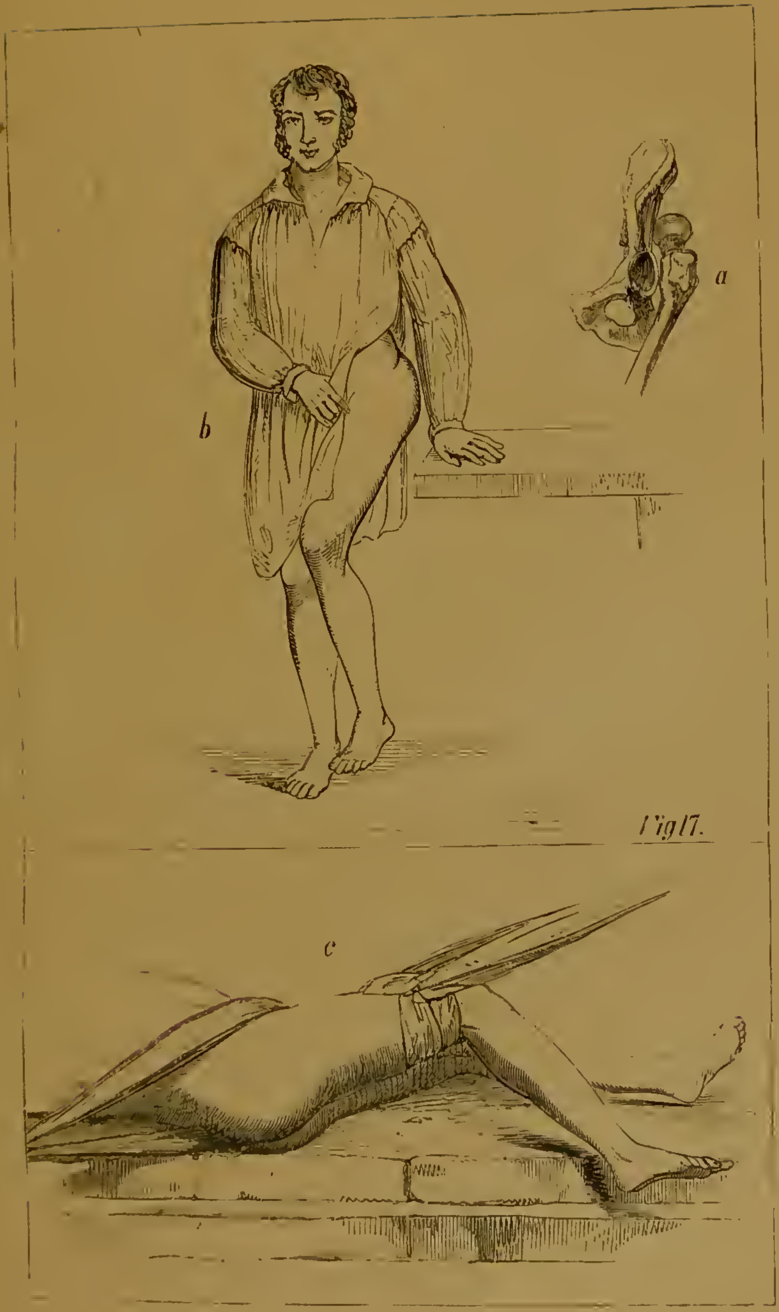


Fig 17.

DISLOCATION OF THE HIP-JOINT.

P. 124.

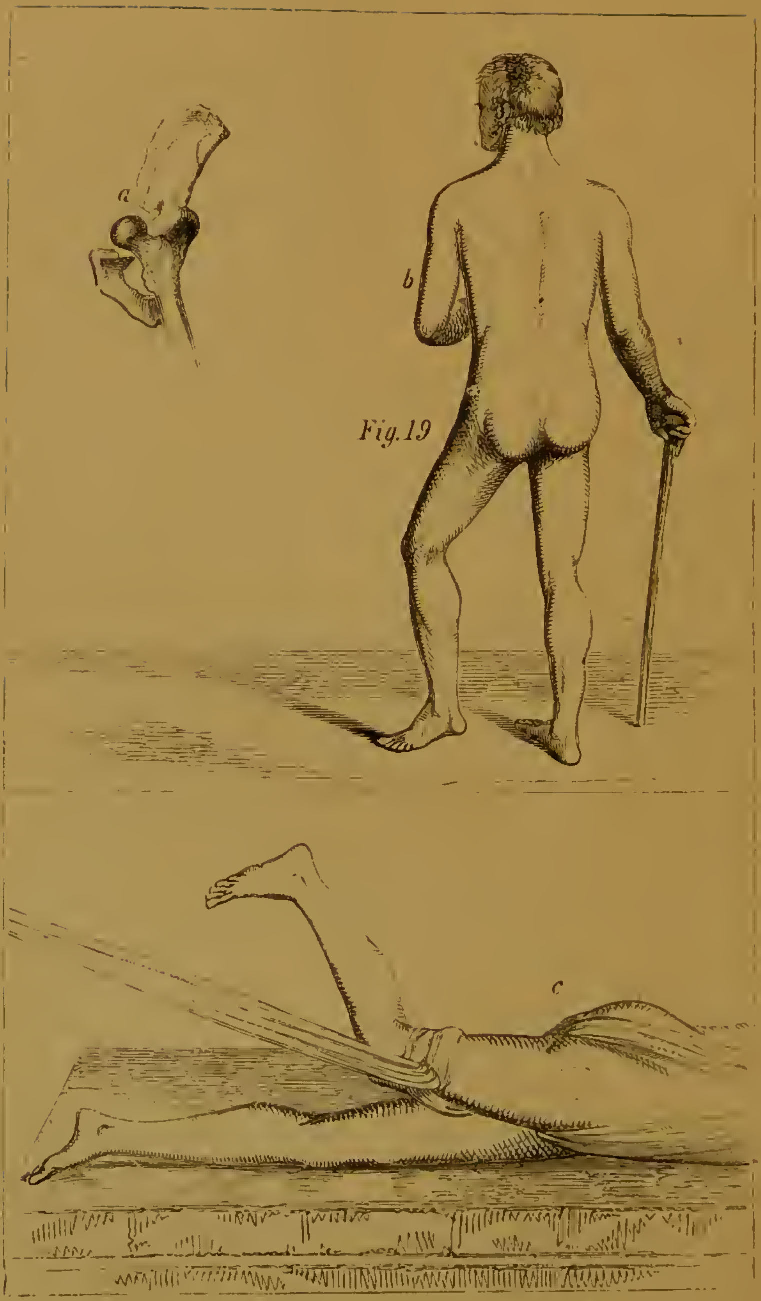
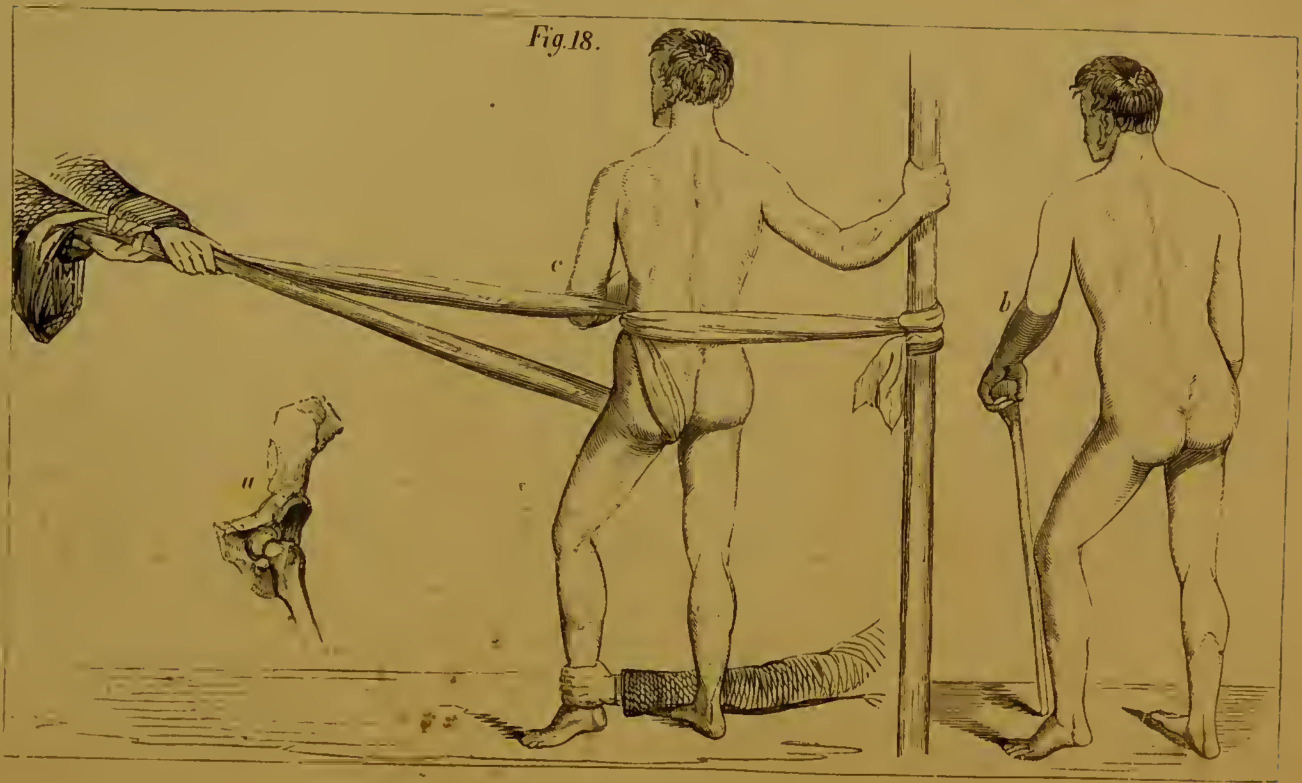


Fig. 19

DISLOCATION OF THE HIP-JOINT ON THE PUBES. P. 425.

Fig. 18.



DISLOCATION OF THE HIP INTO THE FORAMEN OVALE.

P. 425.

the sooner the patient travels in search of more effectual aid, the better, as after the lapse of two or three weeks, it becomes an exceedingly difficult matter to effect the reduction.

(*b*) *Next in frequency to the last kind of dislocation is that in which the head of the bone is lodged in the ischiatic notch behind* its usual and proper socket, but below the back of the ilium. The appearance and other symptoms do not vary greatly from those presented in the last kind, the chief difference being that the dislocated limb is not so much shortened, and that its great toe points to the ball of the great toe of the opposite foot instead of to the instep. The *reduction*, which is exceedingly difficult, is accomplished by drawing the leg more upwards than in the last position, as shown at *fig.* 17 *c*, while at the same time the counter-extension must be made from a much lower point.

(*c*) *Dislocation of the hip downwards and forwards into the ischiatic notch* is even still more seldom met with. The position of the bones is shown at *fig.* 18 *a*, and of the parts during life at *b*. Here the limb is elongated considerably, and also separated from the other leg. When raised into the erect position, the patient is sure to lean to the affected side, but cannot stand without assistance; the toes point straight forward, and the attitude is constrained and painful. Extension, also, in the direction of the limb is of no use, because already the bone is too low; but the proper course is as follows:—Place the patient on a sofa on his back, then surround the injured hip by a broad towel, and fix it to some firm support, on a level with the body; after this, another towel is placed between the thighs, and drawn by force in the opposite direction, both being at right angles to the body (see *fig.* 18 *c*). In a few minutes the operator takes hold of the injured limb at the ankle, and draws it across its fellow, or as near it as possible, and, by using this action at the same time that the thigh is drawn outwards, it may be hoped that reduction will be effected.

(*d*) *The fourth dislocation, or that in which the head of the bone is drawn forwards upon the pubes*, is fortunately exceedingly rare, occurring only once to twelve of the first kind (*a*), five of the second (*b*), and two of the third (*c*). The situation of the bones is shown at *fig.* 19 *a*, and that of the parts in life at *fig.* 19 *b*. Here the limb is shortened about an inch, the knee and foot are turned outwards, and the knee is drawn forwards, and away from the other. The head of the thigh-bone is distinctly felt in the groin, where it forms a considerable swelling. The *reduction* is effected by making counter-extension over the body, and in the line of the spine (see *fig.* 19 *c*); while extension is made in the manner shown in that figure, the limb being drawn downwards and backwards, with the knee slightly bent. While this is being done, an assistant passes a towel between the thighs, and endeavours to raise the head over the pubes, while the operator aids in directing it into the socket, by rotating the limb inwards, using the foot and leg as a lever for that purpose. It is, however, almost a hopeless task for the inexperienced hand to attempt such an undertaking.

1320. DISLOCATION OF THE JAW can only take place forwards, and is generally occasioned by unusually violent yawning, but also by any forcible opening of the mouth in other ways. The position of the bones is shown at *fig.* 20 *a*, and the *fig.* 20 *b* is a sketch of the appearance during life. This dislocation may occur on both sides, or it may be confined to one articulation. The symptoms are as follows:—The mouth is wide open, and cannot be shut, but after a lapse of time the teeth may be brought nearer together than at first; the pain is variable in degree, and there is a decided hollow felt immediately before the passage to the ear. *Reduction* is effected by introducing the thumbs (well guarded by rolling a napkin round them) between the teeth, and placing them far back on the molar teeth, the jaw is grasped and depressed at the back, while the teeth are brought together. In a few seconds a snap is heard, and all is right. Sir Astley Cooper practised a mode which is very efficient, consisting in placing a cork far back between the molar teeth of the two jaws on each side, and then raising the chin the two jaws are brought forcibly together, and a similar result takes place. This method, however, requires the presence of sound and firm molar teeth on both sides and in each jaw, and is not, therefore, applicable to all cases.

SECT. 5.—TREATMENT OF RUPTURE, PROLAPSE, &c.

1321. BY A RUPTURE OR HERNIA, we understand the escape of a portion of the contents of the abdomen through the muscular walls which enclose it. It may occur at any part of those walls except posteriorly, where the strong muscles of the back and loins, as well as the bones of the spine and the pelvis, physically prevent the possibility of such an accident. Sometimes a portion of the stomach or the liver is thrust upwards through the diaphragm into the chest, but this is very rare indeed, and wholly beyond the reach of art; at others, the bladder or the lower bowels are driven downwards, through the lower opening of the pelvis, and by the side of the natural outlets; but these, also, are not by any means common events. Again, any part of the front of the abdomen may give way, and allow the escape of a portion of the intestines; and if this occurs indiscriminately, it is called a *ventral* hernia, but when, as is most usual, the rupture takes place either at the navel or in the groin, it receives the name of *umbilical* rupture in the first case, or of *inguinal*, *femoral*, or *scrotal* in the second. We may, therefore, be satisfied with ascertaining the proper treatment of these four last kinds.

1322. A RUPTURE MAY BE KNOWN from other swellings by its sudden appearance (generally after a violent exertion or fall), by its momentary increase on coughing giving a sort of impulse to the hand placed upon it, and by its soft and elastic consistency. The swelling generally contains a portion or "knuckle" of intestine, which is more or less full of gas and *fæces*, but very often there may be also, or sometimes by itself, a piece of the *omentum* or *caul*, which is of a fatty consistency, and therefore feels solid and inelastic. These are contained in a bag or pouch of the *peritoneum* (par.) 245), and are also covered by other thin muscular or fibrous layers, which consist of the natural walls of the abdomen spread out by the force which thrusts them out of their place. In consequence of the serous nature of the peritoneum which forms the sac, and of the similar structure of the external coat of the intestine, inflammation is soon set up and rapidly goes on to produce adhesion or effusion of serum, or even to mortification in extreme cases. For these reasons, it is highly important to avoid any violence which may lead to these results.

1323. INASMUCH AS THE INTESTINE is protruded through a fibrous or muscular opening, it often happens that after its escape the edges of that opening contract and prevent its return by any ordinary means. When this is not the case the contents of the sac return into the abdomen by the force of gravity, whenever the position of the body is such as to exert that power upon them—as, for instance, in the recumbent position, or still more, when the hips are elevated above the level of the head. But if this contraction of the opening exists, no such return takes place, and the rupture is then said to be "incarcerated;" or, if the pressure is so great as to interfere with the circulation of blood and the regular passage forwards of the contents of the bowels, it is said to be "strangulated." An incarcerated rupture may go on for years without actual mischief, though there is always danger of its occurrence; but a strangulated hernia is attended with the greatest danger to life, and if not relieved, will inevitably end fatally in the course of two or three days.

1324. ALL RUPTURES, therefore, must be regarded under three points of view, viz.—1st, when *reducible*; 2nd, when *incarcerated*; and 3rd, when *strangulated*.

(*a*) *A reducible rupture* should always be kept in the abdomen by

Fig 16.

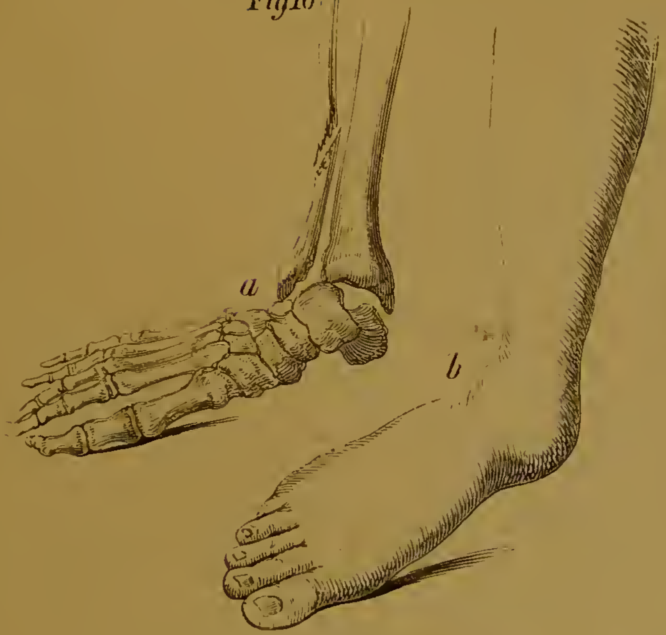
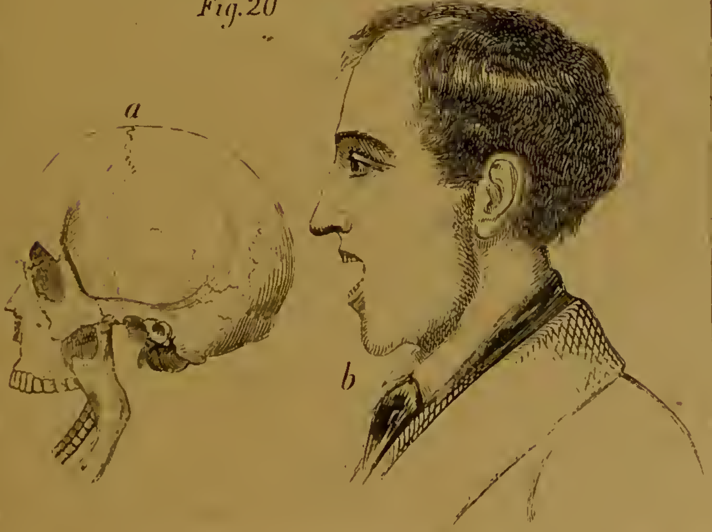


Fig. 20



DISLOCATIONS OF THE ANKLE AND JAW. P. 426.

Fig 1

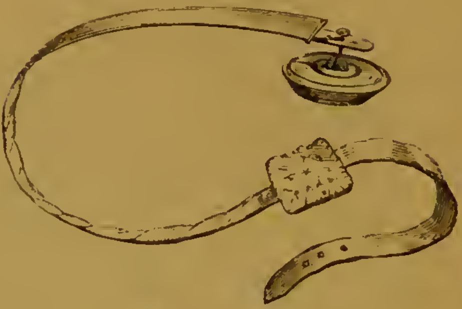


Fig 2

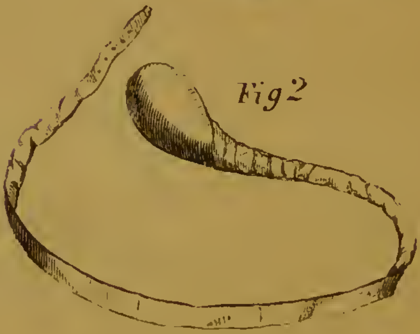
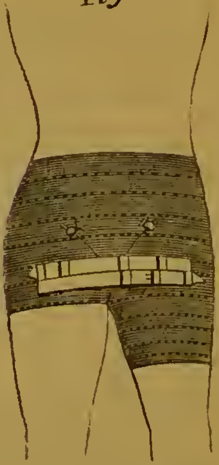


Fig 3



TRUSSES.

P. 427.

means of a proper truss, which must be carefully adapted to it, according to its nature—that is, whether it is *umbilical*, *inguinal*, *femoral*, or *scrotal*. For an umbilical hernia, no truss is so good as that known as Salmon and Ody's, or the "ball and socket," in which the pad is fixed on that principle, and allows of free play in every direction (see *Trusses*, *fig.* 1). The ruptured intestine should first be returned into the abdomen in the recumbent position, and then the truss should be applied. It may be taken off at night, but should never be omitted during the day. When this rupture occurs in infancy, a truss cannot be borne, and besides this the growth is so rapid, that an instrument which fitted to-day would in a month be far too small. Hence, pressure made by compresses held in place by leather spread with adhesive plaster is adopted, as described at page 278. For *inguinal*, *scrotal*, or *femoral* ruptures, all of which occur in the groin, and vary little in situation, the ordinary truss, as shown at *fig.* 2, answers quite well for most cases; or in very difficult ones, that sold by Cole of Charing Cross, in which there is a spiral spring within the pad, will be found to be most efficient. Here, also, the rupture should be returned in the recumbent position, and then the truss must be applied, and should be kept on at all times but when in bed. In *scrotal* rupture the bowel passes out of the abdomen at the groin, a little above the bone, but afterwards glides down into the scrotum. Hence, when returned, the bowel is kept in its place by the same kind of pressure as is available in inguinal rupture. In *femoral* rupture, the intestine passes out of the abdomen lower down than in inguinal rupture, and the truss must, therefore, be more turned downwards towards the thigh. The "ball and socket" truss is sometimes used for these ruptures, as well as for those at the navel; and in slight cases, where the opening is small, it answers every purpose, but in bad ones it does not retain the bowel, but allows it to escape from its pressure. It is, therefore, not to be relied on, though from being used without a perinœal strap, it is very comfortable. There are many trusses which are asserted to do their duty without a spring, but none that I have ever seen are really efficient.

(*b*) *All reducible ruptures*, when they are down, and yet do not readily pass back into the abdomen on lying down, should be returned as soon as possible, by means of a species of manipulation, which, in surgery, is termed "*the taxis*." It consists in first relaxing the parts by warm-baths, or bleeding, or both combined, as well as by bending the thigh upon the body in the reclining position; then placing the hands on the tumour, it is gradually pushed back into its place by a kind of rolling action, chiefly exerted on the upper part, so as to avoid choking the opening. Great force is not to be employed, for fear of producing inflammation; and in many cases, a very slight pressure used judiciously will be successful; but in others, either from an adhesion between the intestine and the sac, or from the bowel having become thickened since it came down, or from its containing a mass of *fæces*, it is impossible to effect the reduction, and the case is then one of those described above as "incarcerated," or perhaps "strangulated."

(*c*) *The incarcerated hernia* must be left alone, in the hope that it will not become strangulated; for no truss can be worn, nor indeed can any measure be adopted which is likely to be of the slightest use. If it gets very full, cold lotions will sometimes afford relief. The bowels should never be allowed to become costive, and every precaution should be taken to avoid violent exertion.

(*d*) *Strangulated hernia* may possibly be relieved by "the taxis" (see *b*), if there is no physical impediment to reduction, so as to make the case incarcerated. If, however, in spite of all that can be done, the bowel cannot be returned, and there are signs of the strangulation being so imminent as to threaten life, an operation must be performed for the liberation of the intestine by means of a division of the obstruction with the knife, which a surgeon only can perform. When, therefore, there is any difficulty in returning a rupture, the best surgical aid in their reach should at once be summoned, and no further attempt should be made at reduction, which will only tend to increase the already existing inflammation.

(*e*) *When a truss is required*, and the patient cannot himself go either to a surgeon or to a surgical instrument-maker, he should carefully describe the nature of the rupture, including its size, and that of the opening through which it escapes, if it can be felt by passing the finger into it. Besides these points, it is only necessary to send the exact measurement around the body at the part where the rupture exists; but it is as well to add any information as to the degree of fatness, or the reverse, of the patient.

1325. PROLAPSE is a falling down of the contents of the pelvis, either through the *anus* (*prolapsus ani*), or through the *vagina* (*prolapsus uteri*). Both of these arise from a want of tone in the muscles surrounding these parts, as well as from congestion of the mucous membrane lining them, by which it is rendered full of blood, and is, therefore, more readily forced downwards out of its place.

(*a*) *In prolapse of the anus*, great attention must be paid to the state of the liver, which should be kept free from congestion, because of the impediment which that state affords to the free return of the blood from the intestines, as seen in piles (par. 417) Whenever the lining of the bowel is prolapsed (as after a motion, or any violent exertion), it should immediately be returned by the oiled finger placed flat upon it, and gradually forcing it up, when a voluntary contraction of the *sphincter* (the muscle closing the aperture) should be made in order to keep it up while the vessels become unloaded, and this is much assisted by the recumbent position. Those who are subject to prolapse should always throw up two or three ounces of cold water into the rectum with a small syringe before each motion, by which the straining incidental to that operation is prevented, and at the same time the vessels of the part are made to empty themselves by the stimulus of the cold. Sometimes an astringent injection gives relief, using it regularly about a quarter of an hour after each motion. It may be made as follows:—

Take of Gallic acid, ʒj.
Matico leaves, ʒij.
Boiling water, ℥viij.

Mix, and after standing two hours, strain; a table-spoonful is to be thrown up into the bowel at a time with a small syringe. In extreme cases, a *truss* is made for the purpose of keeping up the prolapsed bowel; and it may be composed either of an ivory knob on a metal arm, attached to a belt round the waist, and coming from behind between the legs, or else a pad of vulcanised indian-rubber is fixed there by a strap attached before and behind to a belt. The former of these methods is by far the most cleanly and efficient.

1326. PROLAPSE OF THE WOMB will be included under the *Diseases of Women* at chap. 23.

SECT. 6.—DEFORMITIES DEPENDING UPON IRREGULAR MUSCULAR CONTRACTIONS.

1327. CURVATURES OF THE SPINE, arising from irregular contractions of the muscles attached to it, have been described at page 139, and their *treatment* considered among the scrofulous diseases of children, at page 327.

1328. CLUB-FEET are always congenital, appearing to depend upon the greater contraction of some muscles than of others before birth, thus drawing the foot out of its natural position in four different directions, which are known in surgery by the following names—viz., *talipes equinus*, *talipes varus*, *talipes valgus*, and *talipes calcaneus*. It is of no use for the mother or nurse to attempt the cure of these deformities, since they are all beyond the reach of improvement, except by the method discovered of late years, and known as the subcutaneous division of the contracted tendons. By this no external wound remains, although the tendons are so completely cut through as to allow of the easy replacement of the bones in their natural and proper positions. In spite of the apparent change of form which the feet so deformed present, the bones are really as perfect as ever; and when the cure is completed, very little difference can be detected from an average foot, except that it does not present the elegant proportions of a statue, or even those of a handsome foot which has been accustomed to be confined in a boot. Whenever, therefore, a case of this deformity occurs, the parents should at once make up their minds to submit it to the care of a competent surgeon accustomed to the treatment of deformities; and they may console themselves with the knowledge that the feet will be restored to a good and useful shape without danger to life, and with very little pain.

1329. Permanent Muscular Contractions are often met with about the larger joints of the body, which may sometimes be made to yield, by their division, to the same method of treatment as is alluded to in the last paragraph. They should, therefore, always be placed under proper surgical care.

CHAP. XIV.

TREATMENT OF INFLAMMATORY DISEASES AND FRACTURES OF THE BONES.

Sect. 1.—Treatment of Inflammation of Bone and its Consequences.

1330. Inflammation of Bone, when it occurs in the *acute form* (see par. 284), must be met by very active treatment, or it will inevitably go on to suppuration or caries. General or local bleeding, according to the extent of the mischief, or both even sometimes, must be adopted, together with the free use of tartar-emetic and calomel internally. In *the chronic form* counter-irritants will be most successful, such as blisters or issues; or the ointment of biniodide of mercury, which produces a considerable degree of inflammation in the skin, and by the specific effects of its component parts, is also of use when absorbed. Small doses of mercury and iodine may likewise be administered internally. Thus—

Take of Tartar-emetic, gr. ij.
Calomel, gr. viij.
Opium, gr. ij. to iv.
Confection sufficient to form eight pills,

one of which is to be given three times a day. (*In the acute form.*)

Or, take of—
The compound pill of calomel, gr. v.
Extract of conium, gr. iij.

Mix, and make into two pills, to be taken every night. (*In chronic inflammation, with the annexed mixture.*)

Take of Iodide of potassium, ʒj.
Spirit of nitric ether, ʒiij.
Water, ℥viiss.

Mix, and give two table-spoonfuls three times a day. (*In chronic inflammation*).

Take of red iodide of mercury, ʒj.
Lard, ℥j.

Mix, and rub a small piece into the skin *over the chronically inflamed bone*. *Low diet* is to be adopted in the acute form, but is not to be carried out to any extent in the chronic stage, when a moderately good diet must be allowed, but short of stimulation.

1331. When Inflammation of the Periosteum of an acute character shows itself, it must be treated like that of the bone itself (see last par.); but if it assumes the chronic form (as described at par. 286), and occurs in a scrofulous subject, the iodide of potassium without mercury, and given in union with sarsaparilla, will be the most appropriate treatment. Thus—

Take of Iodide of potassium, ʒj to ʒiss.
Compound essence of sarsaparilla, ℥j.
Spirit of nitric ether, ʒiij.
Water, ℥viss.

Mix, and give two table-spoonfuls three times a day. At the same time the tincture of iodine may be painted over the thickened periosteum every day, or every other day; or the ointment of the iodide of potassium, or even that of the biniodide of mercury, may be rubbed in.

1332. In the Treatment of Abscesses of Bone (par. 287), the same general management as is practised in all inflammations should at first be adopted, in the hope of arresting the formation of matter in large quantities, and afterwards in order to effect the absorption of it if it is poured out. Iodide of potassium is the most successful in these cases, and should be given in the same way as is ordered for chronic inflammation of bone (par. 1330). Friction over the surface is not likely to do good, and often converts a trifling mischief to the bone into a severe and large abscess. As soon as matter is clearly formed, and appears at the surface of the bone, it should be let out, but with a small incision, so as to avoid the admission of air. The treatment of abscesses occurring in the interior of the large bones, is scarcely within the reach of domestic surgery.

1333. Caries (par. 288) is occasionally cured by one or other of the three following *natural* processes:—1st, *by a change in the action* of the part, by which granulations are formed which are afterwards converted into healthy bone; 2nd, *by a process of exfoliation*, in which the whole of the dead portion of bone is thrown off in a layer (hence its name), the living parts effecting the separation by ulceration, in the same way as in mortification of the soft parts; 3rd, *by anchylosis, or bony union*, which is effected by a new substance being thrown out from each of two or more carious bones; and this becoming converted into bone, the whole are rendered stiff and incapable of motion. This is the most desirable termination to *caries* when it involves the ends of bones. If, therefore, the treatment which has been adopted for the previous inflammation in the bone, according to the plan laid down at par. 1330, has not been successful, it only remains to promote, as far as possible, one or other of the above three natural cures of the disease. As soon, therefore, as it is clear that the *caries* has taken place, it is improper to continue the lowering treatment which has hitherto been practised, because it impedes the natural methods which are necessary to effect the removal of the unavoidable consequence of the inflammation. Mercury is especially opposed to the cure of caries, as also is iodine in its raw state; but the iodides of potassium or iron, which may to a certain extent be considered as tonics, will sometimes assist the progress of the cure. In many situations the surgeon will be able to effect the rapid removal of these dead portions of bone, either by the knife or by strong caustics; but these measures are beyond our consideration here. In all cases rest is indispensable, whether exfoliation or anchylosis may be the process to be established; but, if the latter is selected, then the more perfect the quietude of the joint the more probable will be the bony union, which must be strong and firm to be of much use. (See *Scrofula*).

1334. Necrosis (page 94) can only be treated with any advantage by aiding nature in separating the *sequestrum*. Besides supporting the strength, which is severely taxed, and which can scarcely be too much nourished short of over-stimulation, the only thing to be done is to remove it by an operation; but as this is a most difficult and severe one, it must necessarily be avoided by the domestic surgeon, and as there is here always time to obtain proper medical assistance, it is utterly useless to enter upon the subject.

SECT. 2.—TREATMENT OF FRACTURED BONES.

SUB-SECT. A.—FRACTURE-APPARATUS AND ITS APPLICATION.

1335. FROM THE DESCRIPTION OF THE CURE OF FRACTURES set up by nature, as given at page 94, it will be evident that the principle in every case is to apply some temporary substitute for the broken bone, which shall keep its two portions close together until the *callus* there spoken of shall have become hard and firm, when it may gradually be withdrawn. This substitute is composed of what are called splints, which are thin layers of some firm material applied to the surface of the limb, and kept there by tapes or bandages around them. In fact, it is a temporary conversion of the patient's leg or arm into a crab's claw, in which animal, as in all the *crustacea*, the solid material is external to the body. There are various kinds of splints used by the surgeon; but as it is not to be supposed that any one would undertake the management of a fracture, except at a distance from all surgical aid, where he would only be able to obtain the most simple kind of splint, namely, one of thin wood, the description here will be confined to the management of fracture by this means alone, together with common pads and bandages, which are always procurable.

1336. WOODEN SPLINTS are easily made by any person possessed of the most common carpenter's tools, though a convex plane is desirable, in order to hollow out the interior, if possible; but if this is not to be obtained, a gouge will serve the purpose sufficiently well, as the hollow is very trifling, and a piece of broken glass and sand-paper will take off all the slight projections left by an inferior workman. For nearly all the fractures which occur, a set of straight splints which reach from joint to joint will suffice, but for the thigh a long one, extending from the waist to below the ankle, should be used; and for the leg proper, we must have one in which an ankle-piece is added. If, therefore, unfortunately, an unprofessional person has to undertake the task, he must set to work to make or procure a certain number of these splints which will vary with each fracture, as presently to be described, not only in length but in breadth, and also in the depth of the hollow. It is better to make them at first long enough to reach a little over the joint, and then each may be easily cut to the proper length, as it is adapted. There is considerable art in making a leg-splint for the outside, as it should have an angle to fit the ankle, where a hole, also, should be chambered, as will be shown under the head of *Fracture of the Leg.* This angle, unless it is made of a very tough wood, will be sure to break if it is not covered with canvas glued to it, and if made of deal, it should always be so guarded.

1337. WHEN THE PROPER SPLINTS ARE OBTAINED, the next thing is to pad them, so as to avoid injuring the soft parts which cover the ends of the bones where their pressure is especially made. For this purpose wadding or tow must be employed, or some similar soft material. A piece of linen or calico, about three times as broad as the splint and a few inches longer, should be prepared; then laying it by the side of the splint, a quantity of the wadding, cotton, or tow is placed upon it, of such a thickness and size as to form a pad a little larger in all directions, and about half-an-inch thick. Afterwards cover it over with the calico, and turning in the ends and sides, they are lightly tacked in their places and the worst side laid upon the splint, leaving a smooth and soft surface for the skin, when it is fit for use.

1338. TAPES, OR A BANDAGE, are also wanted, and then the apparatus is complete. The tapes are used double, and are generally applied at each end of the splints, and also in the middle. In doubling the tape, there is, of course, a loop at one end, through which, after encircling the limb, one of the other ends is passed, and then drawing it tight, the other is tied to it with a bow-knot in the usual way—the assistant holding the splints firmly in their places while this is being done. If a bandage is used, it is applied in the same way as described at page 266.

1339. If Cold Lotions are required to keep down inflammation, they are used between the splints, and generally consist of the ordinary evaporating lotion, as follows, or plain water, as cold as it can be procured, will answer nearly as well :—

Take of Liquor of acetate of lead, ʒiss.
Vinegar, ℥iss.
Spirit of wine, or gin, or brandy, ℥j.
Water, ℥ixss.
Mix, and form a lotion.

Sub-Sect. B.—General Principles of Treatment.

1340. In treating a Fracture, the first thing to be done is to detect its nature as far as possible, which can be effected by examining the limb carefully.

1341. The Symptoms by which a fracture is distinguished from other accidents are—1st, *an obvious deformity;* 2nd, an *unnatural mobility* by external means, at the same time accompanied by total loss of motion at the will of the patient; 3rd, a *crepitus*, or peculiar grating sound, sensible to touch as well as to the ear, which can scarcely be mistaken if once heard, though sometimes simulated by other diseases; 4th, *pain on moving the limb*, varying a good deal in amount according to circumstances.

(*a*) *The deformity* is almost always apparent, and of itself is sufficient to inform a practised eye of the nature of the accident in many cases. Thus, supposing the thigh to be broken, there is always a loss of the peculiar outline natural to that part; and if the patient is on his back, and the foot is looked at, it will be seen that the toes do not assume the same position as in the other foot, but fall inwards or outwards, generally the latter, in a most unnatural and painful position. So, also, in a fracture of both bones of the leg, the toes will deviate from their usual position; but here the *tibia* is so near the surface that there is sure to be an angular break in the line of the shin, which shows the point at which it is broken. In some obscure fractures there is certainly very little deformity—such as those of the spine, ribs, or pelvis; or, sometimes, in the leg and arm, when one bone only is broken; and in the thigh, when the fracture is high up, and close to the joint—but even here, on a careful examination, the change of appearance is detected by an observant eye.

(*b*) *The unnatural mobility* is very evident, where there is only one bone, or when both are broken where there are two, and it will be found that the limb may be made to assume almost any position, if the pain which the attempt gives does not debar its being persisted in, which of course it always will from motives of humanity, as well as from the ill consequences which are its result. *The loss of power by the patient* is also evident enough, as it is generally perfect and entire in accidents to the limbs, and is very considerable in severe fractures of the bones of the trunk. No man can stand with a broken thigh, or leg, if both bones are gone, or lift his hand to his mouth, if the arm is broken, or if the fore-arm has suffered a fracture of both its bones. A partial fracture will sometimes allow of some use of the limb, but only with great pain; and it therefore is seldom attempted, excepting under most exciting circumstances.

(*c*) *The crepitus* is so marked a symptom of fracture, that the surgeon who hears it is able to announce with certainty that a bone is broken. The sound can only be compared to a grating of two rough surfaces; and, unless there is old inflammation of the sheaths of the tendons round a joint, there is no sound that can well be mistaken for it, and even that is easily distinguished by a practised ear. Sometimes, when air is forced into the cellular membrane, there is a crackly sound called "crepitation;" but it is very little like the *crepitus* of fracture, and so seldom happens in doubtful cases, that it may be dismissed from the subject of inquiry. In order to produce the *crepitus*, it is, of course, necessary to move the bones so as to rub their broken surfaces together, and for this reason, if they over-lap one another much, it is often difficult to give rise to the sound.

(*d*) *The amount of pain* depends so much upon the violence employed to produce the fracture, and upon its direction, as well as upon many other circumstances, that it is not to be relied on at all as a guide in fracture. Sometimes very little is felt, while at others it is most extreme, as in fracture of the ribs, where it is impossible to keep the parts quiet, and in which every inspiration, even of the most gentle kind, is often excruciating, while cough is agony to the patient.

1342. THE MODE OF UNION is briefly described at page 94, and it is only necessary here to allude to the period which is occupied in the formation of the *callus* in the adult. In children the time is much shorter, and in old people longer, so that the time here given must be taken as the average only.

(*a*) *In the first week or ten days* blood is thrown out around the fractured ends of the bone, but no *callus* is yet formed, and therefore excessive quietude is not so important, nor need the limb be "set," if it is an object to postpone that operation.

(*b*) *In the second, third, and fourth weeks*, *callus* is thrown out, but is still soft, and of a cartilaginous or gristly consistence, so that it will allow of being bent. For this reason slight movements of the limb are not fatal to perfect union, so long as the parts are not rubbed laterally on each other.

(*c*) *The fourth, fifth, and sixth weeks* (and sometimes also the seventh in very weakly or old people) are employed in converting the external part of the *callus* into bone itself, while the new matter actually interposing between the broken ends, assumes the character of fibro-cartilage.

(*d*) *Between the end of the sixth or seventh week and the sixth month*, this fibro-cartilage becomes bone.

(*e*) *During the next six months*, the *callus*, thrown out beyond the level of the original bone, which is called the "*provisional callus*," is absorbed, and the bone assumes its original shape if well set—that is to say, if the ends have been thoroughly in apposition.

1343. IF THE FRACTURE IS COMPOUND, the wound of the skin must be dressed in the same way as other wounds (see page 395), according to its nature, taking care to remove the splints as seldom as possible, and at the same time to prevent their becoming soiled with the discharge, by using gutta percha or india-rubber material in some shape, or oiled silk if they cannot be procured. As soon as the wound is healed, the fracture must be considered a simple one, and treated accordingly.

1344. IF THE INFLAMMATION ATTENDING ON THE WOUND RUNS VERY HIGH, the ordinary treatment for that condition must be adopted; but it must not be continued long, or it will stop the formation of *callus*, and interfere with the union of the bones. Indeed, in cases where there is much discharge of pus from the wound, it is often requisite to give wine and other stimulants, in order to support the strength, so as to encourage the formation of the *callus*.

SUB-SECT. C.—TREATMENT OF SPECIAL FRACTURES.

1345. FRACTURE OF THE FINGERS merely requires a thin and smooth piece of deal to be applied on the upper and lower sides, after employing extension, and then a bandage being put on with a tolerable degree of tightness, the whole must be kept on for about a mouth or five weeks.

1346. FRACTURE OF THE METACARPAL BONES (which are those intervening between the wrist and the fingers) should be treated by applying a large and solid, but soft, ball to the palm of the hand, and then bandaging the fingers and thumb over it, and keeping them in this position for about a month or five weeks. If the hand is placed *flat* on a splint, these bones lose their natural arch, which is well preserved by the above mode.

1347. FRACTURE OF THE BONES OF THE FORE-ARM requires for its proper management two splints—one for the inside, and the other for the outside. The former should reach from the bend of the elbow to the tips of the fingers. The latter extends from a little above the elbow to the middle of the hand, and both should be well padded as described at 1337. When these are ready, together with a long and narrow calico bandage, the operator proceeds as follows, varying his plans a little according to the nature of the injury, which may be a fracture of the *ulna only*, or of the *radius only*, or of *both of these bones*.

(*a*) *If the ulna only is broken*, the general outline of the arm is not much disturbed, inasmuch as the radius is the one to which the wrist-bones are chiefly articulated. It may be broken in any part of its length, or it may have the elbow process (*olecranon*) only broken off by a fall upon it; or, again, its *coronoid* process may be fractured. But, supposing the ordinary fracture of the ulna in the middle of the fore-arm to be the accident which is to be *treated*, the plan is to bend the elbow and place the thumb upwards, and the little finger downwards; then making a little extension, the splints are applied and bandaged pretty firmly, taking care to raise the whole hand as much as possible so as to make an angle with the fore-arm, as by this plan the ulna is drawn *from* the radius, the contrary to which has a tendency to take place.

(*b*) *In fracture of the radius only*, the same method is adopted, except that the hand is depressed instead of being raised, the object being the same as before—that is, to separate the two bones which are drawn together by a particular muscle near the wrist.

(*c*) *When both bones are fractured*, rather more care is required in getting the bones into proper apposition—that is to say, in "setting" them, which is effected by a little continued extension and manipulation. After this is done, the splints are put on as before, the hand being firmly bandaged to the long splint, in a right line with the axis of the arm, that is, neither raised or depressed.

(*d*) *When the olecranon is fractured*, the point of the elbow is no longer in its usual situation, since that portion of bone is broken off and drawn upwards from the joint (as shown in *fig.* 1). The power of extending the arm is nearly lost, as it is here that the large *extensor* is attached. There is some difficulty in obtaining the diagnostic sign of "crepitus," and unless the arm is forcibly straightened, and the bony lump is pressed downwards which is felt above the elbow and behind the arm, it is not to be expected at all. Bony union is very difficult to obtain, and that by a ligamentous band will be the most probable means of repairing the injury. The *treatment* consists in first of all relieving the inflammation by keeping the arm straight, or nearly so, and using cold lotions externally, as well as low diet and febrifuges internally. Then, as soon as the parts have become quite cold and free from inflammation so as to bear pressure with impunity, a long splint is attached to the inside of the arm from the shoulder to the hand, and it is bandaged in a straight position; while at the same time some slight pressure is made in a downward direction upon the broken bone itself, so as to coax it into its place, or as near it as can be effected by such means. An experienced surgeon will be able to do more than this; but the task is not an easy one, and the domestic operator had better content himself with the plan I have described, taking everything off in a month, and using gentle passive motion of the joint.

(*e*) *If the coronoid process is broken off*, the fore-arm must be kept as much bent as possible, by bandaging it to the arm in that position, and in the course of a month slight motion may be allowed, with great care to avoid any violent exertion.

1348. FRACTURE OF THE UPPER ARM-BONE, in a large proportion of cases, takes place in its shaft; but now and then its two extremities are broken, the injury being called *fracture of the neck of the humerus*, when the upper portion or head of the bone is broken off, and *fracture of the condyles* when the lower end is the position of the injury. These are still further sub-

Fig 1

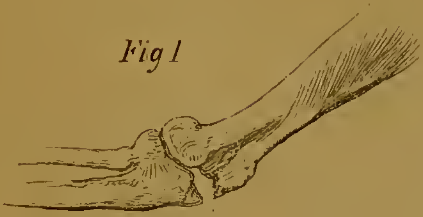


Fig 2

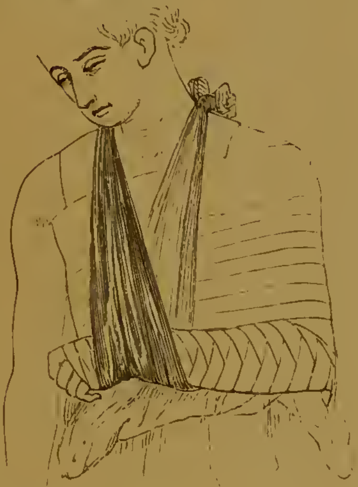
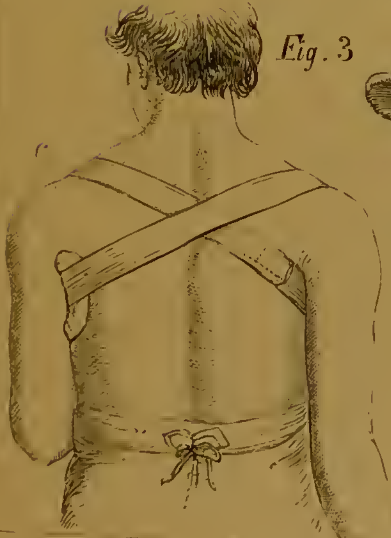
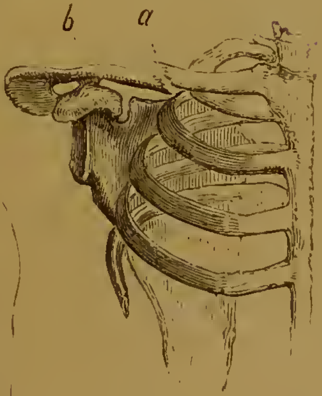


Fig. 3





TREATMENT OF FRACTURES OF COLLAR-BONE AND ARM. P. 134.

divided by surgeons, but for all ordinary purposes it will be sufficient to consider the above three kinds. The apparatus for retaining the bones in their places will consist of ordinary splints, when the bone is broken in its middle; but when either of the extremities is broken off, some further means must be adopted, so as to keep the joints at rest, inasmuch as without this it will be found impossible to procure union of the fragment to the shaft of the bone.

(*a*) *In fracture of the middle of the upper arm-bone*, or of any part of it, excepting about an inch and a-half to two inches from the extremities, the injury is easily detected by the excessive mobility of the arm at the seat of fracture, while the elbow is incapable of being raised. *Crepitus* is easily heard on rubbing the fragments together, and in general the broken ends of the bone may be readily felt. The *treatment* consists in applying two wooden splints, one before and the other behind the arm, and retaining them in their places, either by the buckle-tapes, or by tapes as described at page 431, and over all a bandage. Of course it is necessary to set the bones first of all, which is done by making a little extension, and adapting the ends in the usual way. If the arm is very large and muscular, four splints will be required, in order to embrace it fully and keep it in position.

(*b*) *There are several different fractures of the condyles*, which are distinguished by symptoms peculiar to each, but the ordinary operator can scarcely be expected to make them out; and, if he cannot do this, it is of no use to give him the treatment proper to them. In any case there is *crepitus* near the joint, while the bones of the fore-arm are felt to be sound; and there is in complete fracture an unnatural mobility above the elbow, together with a hollow behind and above it. The *treatment* must be such as will best apply to any of these cases, consisting in bending the elbow to a considerable angle, and keeping it there by means of angle-splints made of mill-board or of gutta percha, the former being cut out of old or new mill-board, for which purpose an old folio book-cover will answer well. After being cut of the proper shape, either of them must be softened by hot water, and being applied in that state, and retained by a bandage, the arm is kept quiet until the material sets; after which it may be put into a sling, and must be kept in this for at least a month or six weeks. Prior to its being "put up" in this way, the inflammation incidental to this accident must be allayed by evaporating lotions, &c. (see par. 1339).

(*c*) *Fracture of the upper end of the arm-bone* may occur in those places which are specially described by surgeons as the surgical neck, the anatomical neck, and just below the tuberosities and above the insertion of the pectoral muscle. In the first two cases the symptoms are very much like those of dislocation of the shoulder into the arm-pit (see page 422); and the *treatment* must be of the same kind in all, consisting in drawing down the shaft of the arm-bone, and pushing up its head by means of a pad in the arm-pit. The parts are retained in this position by fixing the arm to the chest by means of a splint on its outside, and a bandage encircling both, as well as the fore-arm, to prevent its swelling. (See *fig.* 2 of *Fractures.*)

1349. THE SHOULDER-BLADE is liable to fracture, which is caused by severe falls or blows. The most common perhaps is fracture of its neck, which is difficult to distinguish from fracture of the neck of the arm-bone, and like that accident may also be confounded with dislocation of the shoulder, from which the symptoms, detailed at page 423, may serve to distinguish it. The *only available treatment* must, in any case, consist of a similar confinement of the arm to that ordered in the last accident, excepting that it must be supported and not drawn down; but if the processes, called the *acromion* and *coracoid* processes, are broken off, different management is required, though, as these are rather rare, and also difficult to treat, it is scarcely necessary to allude to them further

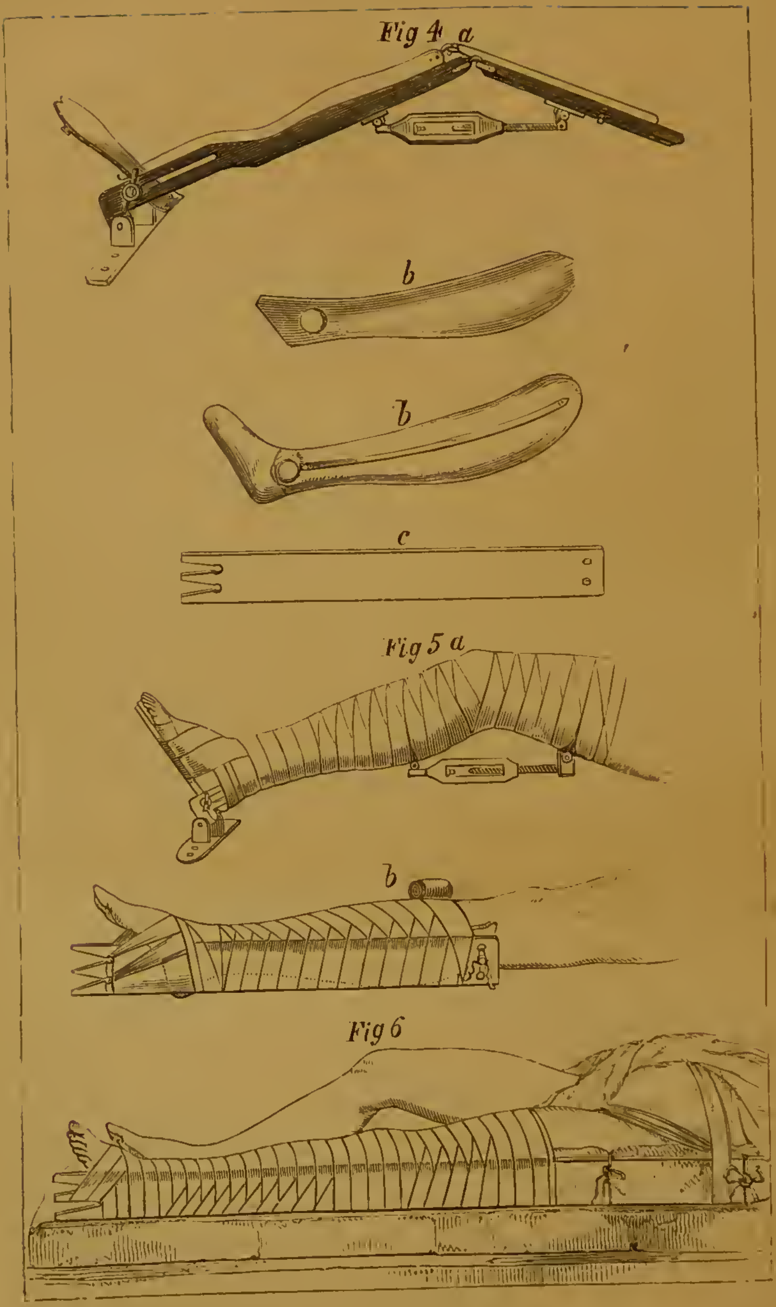
1350. **Fracture of the Collar-bone** is one of the most common of all those happening to the skeleton, especially in children, in whom a fall off a chair or down stairs is very likely to produce it. It is known by the powerless position of the arm, which cannot be raised to the head, by the point of the injured shoulder being nearer the middle line of the body than the corresponding one, and by the swelling seen and felt in some part of the bone, which lies very superficially beneath the skin. On moving the arm, and holding the hand on the swelling, a *crepitus* may generally be heard or felt, but always the two parts of the bone may be seen to move independently of each other. The most usual situation and form of this fracture are shown at *fig.* 3 *a*, in which the broken bone is drawn, with its two parts slightly separated; but it may occur in various ways, as, for instance, in *two places in the middle* instead of one, or at *the middle as well as the outer end*, or *at the outer end only*, or *at the inner end only;* and as these fractures require somewhat different treatment, each will here be alluded to. In any case but the first, a long bandage is required so as to go round both the shoulders, and cross at the back in the form of a figure of 8; and, in addition, some soft material, such as cotton, tow, or wool, is wanted to serve as a pad in the arm-pit, where it performs the double purpose of preventing the bandage from cutting, and of acting as a fulcrum, to which the arm serves as a lever when fixed to the side, and then draws out the collar-bone from the chest.

(*a*) *When the bone is broken externally to the point where it is attached to the coracoid process* by ligaments (see *fig.* 3 *b*), little need be done, as there is scarcely any displacement of the fractured portions, and a sling for the arm is all that is required.

(*b*) *If the fracture is in any other part of the bone, provided it is internal to the attachment to the coracoid process*, the arm falls down, and is also drawn inwards, so as to exhibit all the symptoms enumerated above, with the seat of the fracture plainly indicated by a swelling under the skin. The *treatment* consists in first placing a large pad of cotton, tow, or wool in each arm-pit, then drawing both shoulders well back, by applying a hand to each with some force, while the knee is pressed between them against the back, the bandage is put on, as shown at *fig.* 3 *c*. This, however, only serves partially to restore the bones to their places, for in an oblique fracture, as shown at *fig.* 3 *a*, the two ends overlap, unless something more is done. In order to effect this, the arm is firmly bandaged to the chest in the same way as shown in *fig.* 2, the pad in the arm-pit serving as a fulcrum by means of which and the long lever afforded by the arm below, the upper part with the shoulder and the outer half of the collar-bone are drawn away from the centre of the body. Lastly, it is kept up by means either of a sling in the ordinary way, or of a bandage applied on the same principle.

1351. **When the bones of the toes** are broken, they merely require rest to re-unite. The accident is only occasioned by such crushing mechanical injuries as are sure to bruise and inflame the soft parts, which, therefore, require cold lotions and rest, &c., serving the double purpose also of restoring the fractured bones at the same time.

1352. **The bones of the leg**, like those of the fore-arm, are two, and may either be broken separately, or both may suffer injury. If one is entire, there is much less difficulty in keeping the leg in position as it acts as a splint, and there being no pronation and supination as in the fore-arm, the difficulty is by so much diminished. In all cases, however, confinement to bed is required, as the weight of the body is sure to cause displacement; and even the instinctive muscular action called into play in attempting to assist in getting out of bed is sufficient to impede the proper formation of the *callus*. The chief difficulty in managing a fracture of this part of the body consists in avoiding an angle at



TREATMENT OF FRACTURES OF THE LEG AND THIGH. P. 437.

the point of fracture in the first place, and in the second of preventing eversion of the foot. Both of these objects are gained by the very simple apparatus invented by Mr. Liston, which consists of two portions of sheet-iron, united together at any angle by a rod capable of being extended and contracted, and the lower one furnished with a foot-piece, which may be shifted by a thumb-screw in a slide, and to which the foot is securely bandaged. If, therefore, this apparatus can be obtained, it should always be used, but if not, the ordinary leg-splints must be employed; or the straight one as shown in *fig.* 4 (in which (*a*) shows Mr. Liston's apparatus, (*b*) the ordinary splints, and (*c*) the straight splint.)

(*a*) *In fractures of both bones* (which occur in one-half the number of broken legs), the *symptoms* are a change in the shape and direction of the axis of the leg, accompanied by pain and *crepitus* on examination, or on attempting to move it. On drawing the fingers along the shin, a projection or depression is observed in its course corresponding with the seat of fracture, and the foot may readily be lifted without moving the upper part of the leg; while, if left to itself, it falls below its proper position with the toes generally turned outwards.

(*b*) *When the tibia only is fractured*, the fibula acting as a splint prevents any shortening and to a certain extent displacement; but if the leg is carefully examined, a *crepitus* will be felt, and the seat of fracture may be discovered by tracing the shin along its course, when there will appear at some part a prominence or depression.

(*c*) *The fibula* can only be fractured in its upper part by some blow upon it, or by a wheel passing over it, and the fracture is even then very difficult of detection, from the bone being covered by muscles; but in the lower end it is often broken, either by violence applied directly to it, or through the foot, as in a fall upon that part, when a dislocation occurs, accompanied with fracture of the fibula, generally taking place about two inches above the joint. Here the broken parts are readily felt, because they are only covered by skin, and although there is often great swelling, the nature of the injury is to be made out by a careful examination.

(*d*) *The treatment when Liston's splint is at hand* consists in first setting the bones by a little extension, and lifting or depressing the foot, as may be required; then, having placed a pad on each of the portions of which the apparatus is composed—viz., the *thigh*, and *leg-pieces*, and the *foot-board*—the leg is carefully placed in it, and bandaged as shown at *fig.* 5 *a*. In this apparatus as usually made, the foot has nothing to prevent its slipping down off the foot-board, by which an angle is produced at the seat of fracture, and great deformity results. To avoid this, a heel-piece of leather should be nailed on, as shown at *fig.* 4, and this should be well padded, to prevent its causing a sore by long-continued pressure. If there is much swelling, it is better to let the leg lie in this apparatus without bandaging it, except the foot to the foot-board for some days, using cold lotions until the inflammation abates.

(*e*) *If the ordinary leg-splints* are to be used, they must be applied as nicely and carefully as possible after setting the leg, in the same way as directed above. The angular splint adapted to the ankle is only necessary where both bones are broken, and should then be applied to the outside of the leg with the hole in it, as shown at *fig.* 4 *b*, corresponding with the projection of the lower end of the fibula.

(*f*) *When a straight splint is to be used*, as shown at *fig.* 4 *c*, its length should be such as to extend from the knee to four inches beyond the sole of the foot, with a breadth of three inches and a thickness of about half an inch. This may be made out of any piece of half-inch timber (either deal or any other kind of wood, but the lighter the better) by any carpenter, or with the aid of any ordinary tool-chest. Besides this, there must be a pad, thicker at the lower end so as to allow for the diminution of size in the leg, and a long roller. Then taking this splint with its pad, it is applied to that side of the leg from which the foot has a tendency to turn, by bandaging it with the roller in the manner shown at *fig.* 5 *b.* taking care to bring the bandage from the instep down through the notches in the lower end of the splint on each occasion of making the turns there. Then having finished the application of the bandage in the lower half, a broad piece of bandage or tape is passed round the leg just below the knee, and through the holes in the splint, where it is firmly tied at the moment when extension is being made by an assistant, after which the bandage is carried over all up to the knee. In this way there is some considerable extension maintained; but as the bandage gets loose it will require to be re-applied. This being a plan which can always be adopted whenever a thin piece of board is to be obtained, it is of great utility to the settler at a distance from surgical aid.

1353. FRACTURE OF THE KNEE-CAP is readily detected on an examination of its surface, when a depression will be felt with a considerable separation of the broken fragments. These do not unite by bone, because the two or more portions cannot be kept in close apposition, and, therefore, the union is made good by a ligamentous band between them. In order to facilitate this by proper *treatment*, the leg must be raised with a straight knee above the level of the hip, so as to relax the strong muscles of the thigh which are attached above to the pelvis, and below to the upper edge of the knee-cap. When this is done, by placing a long splint behind the knee, and reaching from the upper part of the thigh to the foot (or Liston's apparatus straightened will do remarkably well if at hand), a bandage is applied tolerably tight above and below the knee over two long pieces of calico laid one on each side, and then the ends of these are tied tightly together, so as to bring the two portions of the bone as near together as possible. The fracture is a long time in uniting, even with the intervention of the ligament, and less than six weeks or two months will not suffice for the retention of the bandage. Of course, if there is much inflammation, here, as elsewhere, the application of this bandage must be deferred till it is relieved.

1354. FRACTURE OF THE THIGH may be in its *shaft*, or *just above the knee*, or in its *neck*, besides some other sub-divisions of the situations in which the bone may be broken, but which being difficult of discovery need not occupy our time and space. In any case the most simple and the best method of *treatment*—if such a severe accident should of necessity be entrusted to an inexperienced hand—is by the long straight splint, which is merely a piece of deal similar in its nature and shape to that shown at *fig.* 4 *c*, but considerably longer, so as to extend from the last rib to four inches beyond the foot. It should also be four inches broad for a full-sized adult, and rather more than half an inch thick. The method of application is shown at *fig.* 6, and will be presently explained.

(*a*) *The symptoms* of a fracture of the thigh-bone depend upon the part which is broken. If the *neck* is broken through, there is a shortening of the leg with eversion of the foot, but very little other deformity of the thigh. There is nearly as much mobility of the hip-joint as usual, by which circumstance this accident may be distinguished from dislocation of the hip, in addition to the *crepitus*, which, however, cannot always be heard. In fracture of the *middle of the bone* or of its *shaft*, the symptoms are so conspicuous as to need scarcely any remarks; but the shortening of the limb is one which must be well considered, in order to avoid it by appropriate treatment. If the fracture is *oblique*, the difficulty of avoiding this is great, as the whole of the muscular power of the thigh is constantly acting in the direction of its length, and causing one fragment to slip over, or "ride upon" the other. Indeed, even in transverse fracture, there is great difficulty in keeping the ends in apposition, as they lie in such a mass of muscles that one portion is very apt to slip up by the side of the other, if some degree of extension of the limb is not constantly maintained. In fracture of the *lower part* of the bone or through the *condyles*, there is not usually so much displacement, on account of their great breadth; but the broken portion may readily be felt beneath the skin, and there is no difficulty in detecting the nature of the accident.

(*b*) *In treating any fracture of the thigh-bone* (excepting where a single condyle only is broken off), the best position and method of treatment is, in my opinion, the straight one, with the single splint as described above; but for all those who have had no practice in surgical cases, and are at a distance from a surgeon it is more particularly desirable, because it is so much more readily applied than any other, and the splint can always be obtained. Its mode of application is as follows, first taking care that all inflammation has subsided if the parts are much bruised and inflamed; but here the difficulty arises, that if the bones are not steadied, there is so much spasm among the muscles that the pain is intense, and inflammation, instead of being lessened, is greatly aggravated. I think, therefore, that even at first it is better to apply the straight splint; but it may be put on with very light bandaging, and so as to accustom the parts gradually to bear the necessary pressure. Afterwards, when the inflammation has subsided, the splint may be put on as follows:—Place the patient on a hard mattrass, then bandage the foot evenly from the toes to the knee; have the splint and pad lining its whole length ready, as well as a silk handkerchief, with a small quantity of wool rolled up smoothly in its centre, thus forming a larger roll than it otherwise would do, and preventing its cutting the skin in the "fork of the legs." Next bandage this splint to the foot, ankle, and leg, taking care first of all to place the toes in the position they are ultimately to occupy, namely, pointing straight upwards. The bandage is applied round the ankle in the same way as for fracture of the leg. After this the handkerchief is to be passed between the legs, and one end behind, the other before, the hips; it is brought up to the holes in the end of the splint, through which it is passed, and tied as tightly as it can be without shaking or displacing the fracture. After which, a short stick is introduced between it and the loops, and after passing two or three turns of a bandage round the waist and the splint, the latter is by it made steady at this point, and then by twisting the stick the handkerchief being shortened draws down the end of the splint, which being attached below to the leg through its intervention acts upon the lower portion of the thigh-bone, until the whole thigh is extended to its proper length, which may be known by examining the toes of the injured limb, as compared with those of the sound one. Lastly, when this is all effected, a short splint is laid along the inside of the thigh, and a roller is smoothly applied from the knee as high as it will go up the thigh, all these appearing as in *fig.* 6. On the average, a broken thigh takes about six weeks to become united so as to bear its own weight and the slight action of the muscles which is excited on first moving about.

1355. Fracture of the Bones of the Pelvis only occurs in very severe falls from a height, or in those crushing accidents when a heavy weight falls upon, or passes over, that part. There is generally, at the same time, severe injury of the contents of the abdomen and pelvis, and, as a consequence, blood is almost always passed from the bladder, as well as very often from the bowels. The deformity is often slight, and unless *crepitus* can be felt, it is not easy to detect the nature of the mischief. In such cases perfect rest is all that can be done to assist nature in repairing the fracture, the injuries to the soft parts being met by lowering treatment if there is no collapse, or by stimulants if there is.

1356. Fracture of the Spine is produced in the same way as that of the pelvis, but it is marked by symptoms of pressure of the spinal cord, which are either paralysis of the lower limbs, or if the injury is in the neck, of the arms also. Nothing can be done in these cases more than in the last described.

1357. FRACTURES OF THE RIBS are, perhaps, the most common of all these accidents to the skeleton. The *symptoms* are acute pain in the side, greatly increased on drawing in a long breath or coughing. By placing the hand flat upon the surface of the skin where the seat of pain is, a distinct *crepitus* is generally felt, though sometimes the fracture is not complete, and then no noise of this kind is heard. The remedy consists in applying a broad flannel bandage eight or nine inches wide round the chest as tightly as it can be drawn, and rolling it all the way from the arm-pit to the last rib, so as to keep the whole of the ribs from rising and falling in respiration. This being the object of the bandage, if it is not tight enough to effect it, no good will ensue. It is generally, also, advisable to take blood pretty liberally from the arm, so as to prevent inflammation of the pleura from showing itself; and should it actually occur, it must be treated on the principles laid down at page 409 for *Pleuritis*.

1358. THE LOWER JAW is frequently broken, either by a fall on that part, or by a kick from a horse, or a blow from a stick, or other similar agent, and occasionally by the force used in drawing a tooth. The bone is here immediately beneath the skin, and therefore there is seldom any difficulty in detecting the nature of the accident, and *crepitus* can be felt on moving the parts together in every instance. The *treatment* consists in using the upper teeth as a ground-work against which the lower jaw is to be held by means of a bandage round the head. A piece of paste-board may be softened by boiling water, and moulded to the surface, so as to assist in keeping the parts together; and then a bandage is passed round the head in such a direction as to secure it, and to keep both portions of the jaw close up against the upper teeth. If the front teeth are entire, a piece of cork or soft wood must be introduced on each side between the teeth so as to allow of a gap in the middle, through which liquid food can be sucked, the cork being shaved off backwards to a thin edge, and about half an inch thick in front. If, however, there are any teeth gone, this is unnecessary.

1359. WHEN THE BONES OF THE NOSE are broken from a blow, all that can be done is to elevate them from the inside, by introducing a smooth instrument, such as a strong probe or a netting-pin. Great care is required to avoid further injury; but by a little manipulation, it is astonishing how much deformity may be avoided. If this is done at once before inflammation sets in, and a cooling lotion (or mere cold water) is kept constantly applied so as to prevent much swelling; in a few days the parts become consolidated, and nature may be left to do her work unaided.

1360. FRACTURES OF THE SKULL are attended with more or less injury of the brain, which must be treated as such (see *Inflammation of the Brain*). Beyond this it is out of the question for any one but a surgeon to interfere, as any operation upon the skull, such as trephining, is attended with the greatest danger.

CHAP. XV.

TREATMENT OF CONGESTION AND INFLAMMATION OF THE GLANDS AND ABSORBENTS.

SECT. 1.—CONGESTION AND INFLAMMATION OF THE LIVER AND ITS DUCTS.

1361. IN THE TREATMENT OF ACTIVE CONGESTION OF THE LIVER (see page 99), the principal point to be attended to is to avoid that over-stimulation of the organ, by the use of rich and "bilious" food, which is generally its cause. Great attention should, therefore, be paid to the *diet*, which should be of the mildest kind, consisting chiefly of roast mutton and beef, with bread, and a very small share of potatoes, cauliflower, or vegetable-marrow. Beans, peas, and cabbages are especially unfit for such cases, and fruit is scarcely ever borne with impunity. The kidneys and skin should be encouraged to do their proper work, by the use of warm baths, if the latter is too dry, followed afterwards by the gradual employment of cold water in the shape of the sponging-bath, and by plenty of friction with the towel. If the kidneys are sluggish, a mild diuretic may be employed of such a character as the following, which is not inclined to act on the bowels, and is also slightly stomachic:—

Take of Nitrate of potass, ʒiss.
Trisnitrate of bismuth, ʒss.
Spirit of nitric ether, ʒiij.
Spearmint water, ℥viiss.

Mix, and give two table-spoonfuls three times a day. If, in spite of all precautions, the secretion of bile is still excessive, and irritates the bowels continually, producing constant diarrhœa, and occasional nausea or vomiting, then give the following for a few days; after which it may be omitted for an equal period, and then given again:—

Take of Diluted sulphuric acid, ʒj.
Compound tincture of camphor, ʒiv.
Infusion of orange-peel, ℥viiss.

Mix, and give two table-spoonfuls three times a day.

1362. PASSIVE CONGESTION OF THE LIVER (see page 99) is a much more manageable condition than that which we have just been considering, *if only patients will properly carry out the remedies which are necessary for it.* Unfortunately, however, it happens chiefly in those who are of a sluggish nature, and who particularly dislike the means which will remove it. Medicine will do a great deal towards its relief, and in some cases will entirely succeed, at all events for a series of years, but at last the congestion becomes permanent; and when it has thus been postponed by the use of drugs, the stomach has generally suffered to such a degree as to unfit it for all the common purposes of digestion, and instead of producing healthy *chyme*, it does nothing but half dissolve the food into an acrid substance, full of lumps; while it is distended with gas in a way which makes life a burden. But by a proper amount of exercise, especially on horseback, all this may always be avoided, joined to a regulation of the food to such a quality and quantity as are suited to the constitution and habits of the individual. The *first thing* to be done is to set the liver and stomach to rights, which medicine will easily effect, aided by exercise in the open air and proper diet. Mercury will be generally wanted *for a short time*, during which it does very little harm, as it is the continued use of this medicine which is so much to be deprecated. The following is the celebrated formula of Mr. Abernethy, which is really a most useful one in setting a sluggish liver going, though it has been dreadfully abused by those who have continued to take it long after it was required, and at a time when milder measures ought to have been substituted to keep up the action:—

Take of Blue pill, gr. iij to v.

every night, followed by a dose of the

annexed mixture three times a day, and both to be continued until the motions become of a good colour; after which the mixture may be taken alone, until the stomach has recovered its tone.

Take of Liquor of potass, ʒj.
Infusion of senna, ℥iss.
Tincture of cardamoms, ℥ss.
Infusion of gentian, ℥vj.

Mix, and give three table-spoonfuls three times a day; *or*, if the bowels are too much acted on by the above, give the following instead:—

Take of Bicarbonate of soda, ʒss.
Sal-volatile, ʒiss.
Infusion of rhubarb, ℥j.
Tincture of cardamoms, ʒvj.
Infusion of cherayta, ℥vj.

Mix, and give as above. As soon as these measures, together with exercise and wholesome moderate living, have procured a free secretion of bile, they may gradually be discontinued; while at the same time the exercise is continued, or even increased. Walking, *and with some agreeable object in view*, should be especially followed out; and if a fondness for some sport or "hobby" can be inoculated into the patient, so much the better. The mind when excited by competition stimulates the liver wonderfully, and far beyond the mere effect of the exercise which is taken as a necessary part of its will. But in some obstinate cases, in spite of the sports of the field, or of active games such as cricket, or of the modern fashionable pursuits comprehended under the various "ologies," the liver still remains torpid, and the bowels, missing the healthy stimulus of the bile, refuse to act with due regularity. The most common mistake made in such cases is to wait until the head begins to ache, and then a "blue pill and black draught" are set to work, and relieve the headache by producing one in the abdomen; but unfortunately the short relief is followed by a still greater sluggishness, the dose is taken at shorter intervals, until at last the head is never free from pain, the stomach is debilitated, and the general bodily strength and mental spirits are at the lowest ebb. Here the only safe remedy consists in the regular use of rhubarb and ipecacuanha, as recommended at page 347, taking care to swallow them on a full stomach as there directed, and beginning their use at a time when the liver is set going by more active means; for this combination is not strong enough to act on a thoroughly congested liver, though it will prevent the recurrence of this condition if used with any degree of regularity. It may be taken for years with every advantage and no drawback, except that connected with pills which are not in themselves pleasant. If this plan is adopted and continued regularly, together with a plain diet varied by the occasional introduction of vegetables and fruits, and avoiding fermented liquors in any quantity, the liver, if not actually diseased, continues to secrete healthy bile, and the bowels are stimulated by it, and by the small dose of the above-mentioned innocuous drugs, so as to give a healthy evacuation daily; no headache is experienced, and the spirits become light, while the strength is not impaired, unless the bowels are too much acted on, which should, of course, be avoided.

1363. ACUTE HEPATITIS (page 99), in the onset of the attack, if occurring in a stout plethoric man, will require the loss of blood from the arm to a considerable extent, in order to prevent its going on to form matter, or other serious consequences detailed at par. 309. Afterwards the side may be leeched or cupped, or these remedies in weakly persons will be sufficient at first without bleeding; then give the following mercurial and aperient, which must not be relied on as possessing any specific properties in reducing the inflammation, but only as acting on the general antiphlogistic principles:—

Take of Calomel, gr. v to viij.
Antimonial powder, gr. iij.

Mix, and give at night.

Take of Sulphate of magnesia, ʒiss.
Tincture of senna, ʒij.
Powdered jalap, gr. x.
Subcarbonate of soda, gr. xv.
Infusion of senna, ℥iss.

Mix, and give as a draught in the morning after the above pills. Either the biniodide of mercury or the strong mercurial ointment should be rubbed into the side, the former serving as a counter-irritant, as well as by its specific properties. The *formula* is as follows:—

Take of red Iodide of mercury, ʒj.
Lard, ℥j.

Mix, and rub in ʒss over the side night and morning until the pain is so great as to make it intolerable, when it may be rubbed over a fresh surface, above or below, behind or before, the first selected. While this ointment is rubbed in, the following mixture may be given:—

Take of Acetate of potass, ℥ss.
Infusion of horse-radish, ℥viiss.

Mix, and give two table-spoonfuls three times a day; *or*, if the pain is very severe, and the inflammation appears to increase, give the following pills, with an occasional aperient, as above prescribed:—

Take of Calomel, gr. viij.
Opium, gr. iv to viij.
Confection, sufficient to form eight pills,

one to be taken every four hours. When in spite of all this an abscess forms, and there is a most exhausting discharge after it is broken, the strength must be supported by bark, beef tea, and port wine, as prescribed at page 355, for typhus fever.

1364. CHRONIC HEPATITIS (page 100). when occurring as a sequel to the acute form, must be treated by the occasional local abstraction of blood, either by leeches or cupping—that is to say, if the general strength is not too much reduced to allow of this measure being adopted. Blisters to the side, or the employment of the biniodide of mercury (see par. 1363), will be very beneficial, keeping up the irritation for a great length of time. The biniodide has the advantage of not lowering the strength; but it is a very painful remedy, and requires some resolution to bear this attendant evil. If mercury has already been given to such an extent as to act on the gums, or to produce salivation, it cannot well be pushed any farther; but if not, it may be continued in small doses for some time—that is, until a slight soreness of the gums indicates that the blood is surcharged with it, and will bear no more without making the effort to get rid of it, which is the nature of salivation. When mercury is no longer useful, iodide of potassium with sarsaparilla may be employed, or the acid mixture given below; but the counter-irritant must be steadily maintained for a long time. The bowels should be kept regularly open, but not purged, by the use of the mildest aperients which will produce sufficient action, rhubarb and ipecacuanha being preferred if strong enough. *In those cases of chronic hepatitis which come on without the previous existence of the acute stage*, there is generally some organic disease of a malignant character, and here mercury is objectionable, as it is in all such intractable complaints. The stomach should be attended to, and made to do its duty, by means of mild bitters, including dandelion, which is specially useful, or of the acid mixture already mentioned, and the bowels regulated in the same way. Counter-irritants also may be employed on the same principle as in the former kind of inflammation, so that it may be understood that the chief difference consists in avoiding mercury, and perhaps iodine, in large doses. The *diet* should be of the most mild but nutritious kind, avoiding everything which can irritate the stomach or bowels as well as general stimulants such as alcoholic liquids of all kinds, and rich animal broths or made-dishes. The following are the *formulas* necessary:—

Take of Calomel, gr. iv.
Powd. opium, gr. iv.
,, rhubarb, gr. viij to xij.
Confection to make eight pills,

one of which is to be given two or three times a day.

Take of Iodide of potassium, gr. xxxij.
Compound essence of sarsaparilla, ℥j.
Tincture of gentian, ℥ss.
Decoction of dandelion, ℥xss.

Mix, and give three table-spoonfuls three times a day;

Or, take of—

Diluted hydrochloric acid,
,, nitric acid, ā ʒj.
Decoction of dandelion, ℥xij.

Mix, and give a wine-glassful three times a day.

1365. Jaundice (see page 101) is described as arising from four different causes, which will require separate treatment.

(*a*) *Jaundice produced by the obstruction of gall-stones lodged in the biliary passages* requires the following indications to be followed out:—1st, to facilitate the progress of the gall-stone; 2nd, to relieve the intolerable pain which would otherwise distress the system; and 3rd, to guard against the inflammation which is likely to be set up by the irritation of the gall-stone. To effect these several purposes, calomel, ipecacuanha, and opium may be given internally, with a saline in addition, and a very *hot* bath should be prepared as quickly as possible, in which the patient should remain until on the verge of fainting, which will often occupy half, or three-quarters of, an hour. The temperature should be from 100° to 104° F., according to the sensations of the patient; and it should be kept up by the addition of fresh hot-water to the highest point which he can bear as long as he remains in it. When he comes out, he should be placed in warm blankets, and the perspiration should be encouraged. One of the pills ordered below should be given if it has been procured before going into the bath, or as soon afterwards as possible, and it should be repeated every two or three hours until relief is afforded, and afterwards as ordered. The nausea produced by the ipecacuanha is of more service than anything else; and it is not, therefore, to be avoided by any means which can be resorted to, such as effervescent medicines, &c. If the bowels act by the use of these pills, they may be given alone, but if not, the mixture below may be combined with them; and if that is not strong enough, a more active aperient (see page 348) must be substituted: but violent purgation is not to be desired. Friction, over the right side, with a warm opiate liniment (see page 349), will often assist the passage of the stone; but the chief reliance must be placed on the above remedies. When the paroxysm of pain, &c., has ceased, there is reason to believe that the stone has passed, and in a few days the jaundice generally disappears after the bowels have been freely relieved by the aperient; but if otherwise, the same plan must be persevered in, omitting the opium and giving the other remedies by themselves. Finally, the stomach and bowels must be strengthened in the same way as ordered under par. 1362. The following *formulas* are alluded to above:—

Take of Calomel, gr. viij.
Ipecacuanha, gr. iv.
Purified opium, gr. iv to viij.
Confection, enough to form eight pills,

one of which is to be given every four hours, or oftener if the pain is very great.

Take of Sulphate of Magnesia, ℥j.
Solution of carbonate of magnesia, ℥j.
Tincture of henbane,
Tincture of ginger, ā ʒij.
Sulphuric ether, ʒiss.
Water, or infusion of horse-radish, ℥vj.

Mix, and give three table-spoonfuls every six hours, if the bowels are confined, together with the above pills.

(*b*) *Jaundice produced by obstruction in the gall-ducts themselves* is generally very unmanageable, because the disease producing it is almost always of a malignant character. All, therefore, which can be done is to give sedatives in as small doses as will afford relief, combined with ipecacuanha, so as to relax any spasm which has come on. Mercury in any shape is to be avoided internally; but the biniodide of mercury externally applied will occasionally do some little good, from the counter-irritation which it sets up; it may, therefore, be tried as a forlorn hope (see par. 1363). Dandelion also is quite innocent of all injurious consequences, and may be given regularly for an indefinite period with or without the addition of the acid. (For the *formulas*, see par. 1364.)

(*c*) *When jaundice arises from disease of the duodenum at the part where the biliary-ducts enter that intestine*, the treatment must be directed to mitigate the cause of the obstruction. Thus, if it arises from a mere temporary congestion of the mucous membrane, with a viscid secretion of mucus, an active dose of calomel, followed by an aperient, will often give immediate relief. As there is generally nausea or vomiting already existing, some aperient remedy which can be kept down must be adopted; and for this purpose the ordinary seidlitz powder will often suffice, adding to it, if necessary, a farther proportion of "salts." The following will be the proportion:—

Take of Calomel, gr. v to viij.
Extract of henbane, gr. iij.

Mix, and form two pills to be taken at night, followed on the next morning by the annexed draught:—

Take of Subcarbonate of soda, gr. xx.
Sulphate of magnesia, ℥ss.
Tincture of henbane, min. xx.
Sweet essence of senna, ʒj to ʒiss.
Water, ℥iss.

Mix, and form a draught;

Or, the seidlitz powder, as above mentioned.

(*d*) *Jaundice produced by the pressure of contiguous malignant tumours* is very little under the control of medicine, and all that can be done is to give mild doses of aperients; but if it is caused by a *distended colon* as it passes across the abdomen from the right to the left side, brisk and warm aperients which will empty that bowel will often give relief (see *Aperients*, page 348). In some cases of pregnancy, jaundice is produced by *pressure of the enlarged womb*; but it is seldom until the later stages, and will be relieved as soon as delivery takes place. It is better, therefore, to avoid unnecessary interference in such cases, merely giving such mild doses of castor-oil as shall keep the bowels freely open, and prevent any further accumulation of bile, at the same time enjoining as much exercise as possible. (See Part II., chap. 23).

1366. IF GALL-STONES OCCASION PAIN IN PASSING THROUGH THE DUCTS, BUT WITHOUT JAUNDICE, the treatment must be the same as is described for the complication with jaundice at par. 1365 (*a*).

SECT. 2.—TREATMENT OF CONGESTION AND INFLAMMATION OF THE SPLEEN AND PANCREAS.

1367. If, in spite of the difficulty of diagnosis alluded to at page 102, there is reason to believe that the spleen is enlarged by congestion or inflammation, it may be desirable to apply leeches to the left side occasionally, together with the use of iodine in some form as a counter-irritant, and perhaps internally also. If it has followed an attack of ague, quinine should be given at the same time, with external counter-irritants.

1368. DISEASES OF THE PANCREAS are wholly beyond the reach of domestic remedies.

SECT. 3.—TREATMENT OF CONGESTIVE AND INFLAMMATORY DISEASES OF THE KIDNEYS AND BLADDER.

1369. SIMPLE INFLAMMATION OF THE KIDNEYS is described at page 102 as *acute* and *chronic*.

(*a*) *Simple acute inflammation of the kidneys is to be treated* on the same principle as the other inflammations, with some slight modifications to suit the particular task which the kidneys have to fulfil. Thus, in many other inflammations, we are accustomed to act upon the kidneys, in order to relieve the general mass of the blood of some of its component parts; but this would only aggravate the mischief going on when the kidneys themselves are actually inflamed, and, therefore, it must be abandoned altogether; and, on the contrary, the mildest *diluents* must be employed, so as to encourage these organs to do their duty by offering to their vessels a bland and acceptable fluid. The *indications*, therefore, are—1st, when the disease is of an active character, with general plethora and a full pulse, to bleed either from the arm, or by cupping, or leeching the loins, or by a union of general, as well as local, blood-letting; 2nd, to produce considerable purgation by such aperient remedies as, when absorbed, are not diuretic, namely, by castor-oil; or croton-oil, if the former will not act, followed or accompanied by opium; 3rd, to act on the skin by producing perspiration through the agency of warm-baths, or by the exhibition of the compound ipecacuanha powder, assisted by warm diluents, such as barley-water, gum-arabic in solution, linseed-tea, or marsh mallow-tea; and 4th, to apply one or other of the embrocations given at page 349, by means of friction with the hand, or under spongio-piline, as there ordered. As soon as the acute stage has passed, if the disease does not entirely pass away, it must be treated as presently ordered under the chronic form into which it resolves itself. The following are the *formulas* likely to be useful:—

Take of Castor-oil, ℥ss to ℥j.
Laudanum, min. x to xv.

Mix, and give as an aperient, to be repeated every six hours until it acts;

Or, take of—
Croton-oil, min. j.
Powdered opium, gr. ss.
Crumb of bread enough to make a pill.

To be given every six hours until it acts. (*This is only to be used when the castor-oil fails to act.*)

Or, take of—
Compound powder of ipecacuanha, gr. x.

Mix, with a little tea or gruel, and give at night, following it at an interval of an hour by a copious draught of linseed-tea, barley-water, or gum-water.

Or, take of—
Calomel,
Purified opium, āā gr. viij.
Confection enough to make eight pills,

one of which is to be given every four hours, with a dose of castor-oil every morning if the bowels are costive. (*These pills are only needed when the inflammation and pain seem very great, and after loss of blood has been carried far enough to reduce the pulse.*)

(*b*) *In chronic inflammation of the kidneys*, counter-irritants of the same kind as those already described at (*a*), may be continued, avoiding cantharides carefully as contained in the ordinary blister, because their active principle is absorbed, and is apt to stimulate the kidneys. Sometimes, however, when the kidneys obstinately refuse to act after acute inflammation, or when they are simply congested without that positive condition, a small dose of the tincture of cantharides affords great relief; but the diagnosis is too difficult for any one but the experienced observer of disease, and such a remedy is, therefore, beyond the powers of the domestic practitioner. The best plan of *treatment* for him to adopt is to give, in conjunction with the embrocations externally as ordered above, the infusion of buchu; or he may perhaps venture upon copaiba, or turpentine even in very obstinate chronic cases, or where it has degenerated into a chronic condition of torpidity, and there is little or no urine secreted. The following *formulas* are added:—

Take of Infusion of buchu, ℥viiss.
Tincture of henbane, ʒij.
Spirit of nitric ether, ʒij.
Liquor of potass, ʒj.

Mix, and give two table-spoonfuls every four hours. (*Useful immediately after the active stage.*)

Or, take of—
Balsam of copaiba, ʒiss.
Mixture of acacia, ℥j.
Spirit of nitric ether, ʒij.
Compound tincture of camphor, ʒss.
Camphor mixture, ℥vj.

Mix, and give two table-spoonfuls every four hours. (*To be given when the kidneys are torpid, after the inflammation has subsided.*)

Or, take of—

Spirit of turpentine, ʒj.
Tincture of opium, ʒj.
Mixture of acacia, ℥j.
Camphor mixture, ℥vij.

Mix, and give two table-spoonfuls every six hours.

1370. IN BRIGHT'S DISEASE, OR GRANULAR DEGENERATION OF THE KIDNEY (see page 108), the attention of the domestic observer must be mainly directed to the remedies which in themselves are innocent of harm, and yet productive of the greatest good if well carried out. Medicine, it is true, may do great good, but it is capable of aggravating the mischief considerably if improperly used; and it requires so much experience to direct its powers aright, that it is far better not to attempt it. There are some medicinal remedies, however, which may be employed with tolerable safety, and these will be here enumerated. The *indications* are—1st, to improve the health by a good but mild *diet*, pure air, and a moderate degree of *walking* exercise, riding being of too violent a nature. In the *chronic stage*, tonic medicines may be ventured on, with some caution in not attempting too much; 2nd, to employ the principle of derivation, both in the *active* and *chronic stages*, by acting on the skin and bowels, and by using those counter-irritants which are not absorbed into the blood. Sea air is often of great use, but pure country air of some kind is indispensable, and the close confinement of a town is almost necessarily fatal. The exercise must be long continued, but moderate, so as to wear down the muscles gradually, without over-exciting the heart and arteries. The following tonic medicines may be ventured on in such chronic cases as are absolutely out of the reach of medical aid:—

Take of Diluted nitric acid,
Diluted hydrochloric acid, ā ʒss.
Tincture of henbane, ʒij.
Infusion of orange peel, ℥viiss.

Mix, and give two table-spoonfuls three times a day;

Or, take of—

Tincture of sesquichloride of iron, ʒj.
Tincture of henbane, ʒiss.
Water, ℥viij,

Mix, and give two table-spoonfuls twice a day. *(Useful when there is great pallor, with decided anæmia.)* In order to act on the skin, it is desirable to give such diaphoretics as will not disorder the stomach, of which the following is the best:—

Take of Liquor of acetate of ammonia, ʒij.
Camphor mixture, ʒvj.

Mix, and give night and morning; and with the evening dose, unite five to ten grains of compound powder of ipecacuanha, if there is any restlessness or difficulty in procuring sleep. As an aperient, when the bowels are not relaxed, nothing is so useful as jalap, which may be given in combination with acetate of potass, as follows:—

Take of Powdered jalap, gr. x to xv.
Acetate of potass, ʒj.
Sweet essence of senna, ʒj.
Mint water, ℥iss.

Mix, and give when required. Warm-baths, and especially warm sea-bathing, are decidedly beneficial by keeping up a proper and regular action of the skin.

1371. IN TREATING THE CONDITION KNOWN AS GRAVEL (see pages 103, 104), there are several indications to be fulfilled, being—1st, to relieve or arrest the secretion of the particular kind of urine which deposits the gravel, and the treatment for which will vary accordingly; and 2nd, to carry off from the body the gravel if it has been formed with as little injury to the passages as can be managed by art. It will be impossible for the ordinary observer to master all the varieties of deposit which are met with; and, therefore, it will suffice to explain the treatment of those which are most common, so that we shall have to consider the best remedies for arresting the deposit of—1st, *red gravel;* and 2nd, *white gravel*—and afterwards enter upon the consideration of what is best to be done when *gravel* or *stone* are lodged in the *kidney*, *ureter*, *bladder*, or *urethra*.

(*a*) *In order to stop or relieve the secretion of red gravel*, inasmuch as it depends upon disorder of the stomach, either from abuse of food or from want of exercise to carry it off, the first thing to be done is to attend to the *diet;* while at the same time such stomachic restoratives are employed as are calculated to improve the tone of the stomach and neutralise the acid as it forms, since its secretion cannot all at once be arrested. The diet should be composed of as little animal food as will serve to support the health, combined with the most digestible vegetables, and those which are as far as possible free from nitrogen—namely, those composed of starch as a main ingredient, such as potatoes, artichokes of both kinds, and French beans as dressed in this country; but not haricots, vegetable-marrows, peas, or broad beans, or cabbages, cauliflowers, and brocoli, all of which are largely composed of nitrogenous materials. Meat must be given in certain proportions, because the stomach has been so long accustomed to it, that it refuses to digest vegetables alone; and, indeed, when mixed with a proper proportion of potatoes and other vegetables, it is quite as good as bread. Nothing is gained by attempting too strict a diet on theoretical principles, because habit has so long played its part in educating the stomach to our usual articles of food, that, if a sudden change is made, the indigestion which results is so great as to cause the secretion of still more acid than before. Hence, a great deal of tact must be employed in abstracting only such elements of mischief as the stomach will suffer to be removed without rebellion, and it is only by feeling our way that this can be done. The principle, however, being once known, practice must teach us how far to carry it out, and the direction is clear enough to eat as little meat and as much non-nitrogenous vegetables as the stomach will digest. Beer and wines are very apt to turn sour, and aggravate the quantity of acid deposited; but here, again, the previous habits must be taken into consideration, and though in theory the patient may be better without them, yet practically they are often *for a time* required to give sufficient stimulus to the feeble stomach, to enable it to carry on digestion. In such a case, weak *French* brandy and water, or with soda-water instead of spring-water, will be found to be the best drink at dinner; while a single cup of black tea, with from one to five grains of bicarbonate of soda in it, will form the most suitable liquid at the morning and evening meals. Cocoa suits some stomachs very well, and if so is better than tea; but with a debilitated stomach, it is too gross, and must in that case be avoided. *Exercise* is all-important, and walking-exercise is the best; but riding is nearly as good, and to many people still better, from its invigorating action on the spirits. Extreme fatigue is to be avoided; but such an amount of one or the other, or both, of the above kinds should be taken daily as will cause a pleasant sensation of lassitude at night. With regard to medicines, the less that is taken the better; but when the stomach is very weak, and the deposit is large, a combination of one or other of the alkalies, in the shape of bicarbonate, is to be given with a bitter, such as gentian or cherayta. Sometimes a mineral acid will act still better than the alkali, especially after these last have been taken for a long time, in which case they seem to cause a species of reaction, which then ends in a larger and overpowering secretion of the acid which at first they controlled altogether. The following *formulas* are useful in *red gravel*:—

Take of Liquor of potass, ʒij.
 Infusion of rhubarb, ℥j.
 Infusion of gentian, ʒvj.
 Tincture of cardamoms, ʒss.

Mix, and give two table-spoonfuls three times a day;

Or, take of—
 Subcarbonate of potass, gr. v.
 Chamomile tea, ℥ij.

Mix, and take twice or thrice daily;

Or, take of—

Cream of tartar, ʒij.
Dried orange peel, ʒss.
Boiling water, Oj.

Mix, and give a tea-spoonful night and morning. (*Useful when the quantity of urine passed is too little.*)

Or, take of—

Diluted hydrochloric acid, ʒj.
Diluted nitric acid, ʒss.
Infusion of orange peel, ℥viij.

Mix, and give two table-spoonfuls three times a day. (*Useful when alkalies have been given for a long time.*)

(*b*) *When white gravel exists*, the proper treatment consists, as before, in attending to the stomach and to the general health, by giving proper exercise and fresh air, with sea-bathing and friction of the skin (see *a*), and in addition a more generous *diet*, consisting of a fair proportion of meat and vegetables, together with such a limited quantity of *dry* wine as will tend to support the strength without upsetting the stomach. The acid mixture given at (*a*) will often be of great service, or sometimes lemon-juice in doses of half a table-spoonful three or four times a day by itself will afford relief, or imperial (see page 250). Decoction of bark, instead of the infusion of orange peel, with the acid as ordered at (*a*), may be employed with advantage in constitutions which are much debilitated; and if there is great restlessness, it may be right to give twenty or thirty drops of laudanum with the evening dose.

(*c*) If there are symptoms of *stone in the kidney*, which can only consist in inflammation, *together with* the presence of gravel (see par. 323), the case must be *treated* as one of simple inflammation of the kidney (see page 445), until the immediate effects are gone by, when all the efforts should be directed to relieve the tendency to form fresh gravel, according to the directions laid down at (*a*) and (*b*).

(*d*) *Stone in the bladder*, when once it exists of such a size as to be retained there, can only be got rid of by operation, which may be either a cutting one (*lithotomy*), or that of breaking up the stone while in the bladder (*lithotrity*). Both of these, however, are most difficult operations, and only to be accomplished by the skilful surgeon. The latter is now generally practised at all ages but in boyhood, when the passage is too small to allow of a sufficiently powerful instrument being passed into the bladder. But when stone exists in the bladder, and at a distance from surgical aid, it may sometimes be necessary to relieve the inflammation produced by it, and especially during the journey which may be required in search of relief. For this purpose opiates must be given, together with such medicines as have a peculiar effect upon the bladder. In fact, the treatment must be that for inflammation of the bladder itself (see page 380), together with opiates, which may be added to the mixture there given, in the dose of ten, fifteen, or twenty drops of laudanum to each dose.

1372. Bloody Urine (page 105) must, as a rule, be relieved by attending to the exact cause which has produced it, and also to the seat of the bleeding, which may be either the kidneys or the bladder, and may be from injury to, or disease in, either.

(*a*) *When the bleeding is from the kidneys, and arises from disease*, such as that known as Bright's disease, or from stone in the kidneys, or from simple congestion, the *treatment* must be entirely guided by the exact condition which is considered to exist. It will, however, seldom be safe for the domestic observer to do more than give rest and gentle purgatives, with perhaps local or general bleeding if it occurs in a plethoric habit of body. Of course, if there is evidence of any decided mischief going on, that particular disease will be at the same time attended to. Thus, supposing it to arise from stone in the kidneys, the treatment would be such as would relieve the irritation from that cause consisting in diluent drinks with anodynes, such as barley-water, linseed tea, &c., together with Dover's powder at night.

(*b*) *Where the bleeding appears to come from the kidneys as the result of accident*, which may be known by the symptoms detailed at page 105, general or local bleeding will often be necessary; but rest and starvation (excepting in very severe injury, when the strength must be supported) will usually suffice. Mild aperients must also be given, and if the bleeding continues, the following mixture may be resorted to:—

Take of Diluted sulphuric acid, ʒiss.
Tincture of digitalis, ʒj.
,, opium, ʒj.
Water, ℥viiss.

Mix, and give two table-spoonfuls three times a day.

(c) *If the bleeding is into the bladder*, it may be from the irritation of a stone, which must be got rid of, if possible, by operation, or it may arise from enlargement and fungoid disease of the prostrate gland, which is common enough in old men. In this latter case it is often necessary to draw off the water and blood by means of the *catheter.*

1373. By Suppression of Urine is understood a total cessation of the secretion (see page 106), and not a partial one which is common enough. The disease is so rare as scarcely to require any remarks here, especially as the treatment is of too complicated a nature to be readily explained. Where, however, the secretion has only partially ceased, ordinary diuretics will often re-establish it, taking care not to give stimulating remedies when there is inflammation going on. The following may be of service in such cases:—

Take of Nitrate of potass, ʒj.
Spirit of nitric ether, ʒiij.
Tincture of henbane, ʒij.
Spearmint water, ℥vij.

Mix, and give two table-spoonfuls every four hours.

1374. Strangury is a partial suppression of urine, generally arising from the absorption of the active principle of cantharides in the blistering-plaster. It may be relieved by copious draughts of barley-water or linseed-tea, aided by the following mixture:—

Take of Mixture of gum acacia, ℥j.
Bicarbonate of soda, ʒj.
Nitrate of potass, ʒj.
Tincture of henbane, ʒij.
Camphor mixture, ℥viss.

Mix, and give two table-spoonfuls every four or six hours.

1375. Retention of Urine (see page 106), may be caused in various ways.

(*a*) *If it arises from paralysis of the bladder*, either permanent or temporary, as in fever, &c., it can only be relieved by the regular employment of the catheter at fixed intervals of six, eight, or twelve hours. This should be carefully attended to in all such cases, and especially in bad fevers, in which it almost always occurs.

(*b*) *When retention is caused by spasm* either at the neck of the bladder or in the urethra, a warm-bath is the best remedy, and it should be continued for at least half, or even three-quarters of, an hour at a high temperature (100° to 105° F.), unless the bladder is relieved previously to the expiration of that time. If the bath is not successful, opium with camphor, or the tincture of the sesquichloride of iron, must be tried as follows, or sometimes bleeding from the arm must be had recourse to in extreme cases, or a dozen or even two dozen leeches may be applied to the *perinæum* with great advantage; and this local bleeding, especially when followed by the warm hip-bath for the leech-bites to bleed into, is the very best remedy which can be employed.

Take of Powdered opium, gr. j to iss.
,, ipecacuanha, gr. j.
,, camphor, gr. ij.
Confection enough to make a pill,

which may be repeated in six hours, if relief is not obtained;

Or, take of—
Tincture of sesquichloride of iron, ʒj.
Comp. tincture of camphor, ʒv.
Camphor mixture, ℥vij.

Mix, and give two table-spoonfuls every three hours until the spasms cease.

(*c*) *In retention from enlarged prostate*, a very large catheter of a form specially intended for this disease must be passed, as the only means of giving relief, and will very generally be required at short intervals for some days after the first necessity for its employment.

(*d*) *Stricture of the urethra* can only be treated successfully and safely by the surgeon who is able to pass a succession of instruments, so as to dilate it by degrees, and thus remove it entirely.

1376. INCONTINENCE OF URINE (see page 107), as occurring in children, is generally to be cured by moral as well as physical treatment. In carrying out the former of these, the child should be roused from sleep within the period at which the urine is generally passed in bed, and made to pass it into a proper vessel. This should be repeated again and again, if necessary, with such persuasion as may be considered likely to induce the child to give his aid. In addition to this, it will be right to use cold sponging of the back, loins, and thighs, especially on going to bed, and to avoid giving much liquid towards the evening. But when the incontinence occurs in after-life as the result of disease or accident, the only relief which can be afforded consists in the regular wearing of the India-rubber receptacles which are now sold by every instrument-maker, who will adapt them to the precise condition which may exist. They are, at the best, only disagreeable palliatives of a most unfortunate condition, but they are certainly better than nothing at all.

1377. DIABETES, OR AN IMMODERATE FLOW OF URINE, may be attended either with a discharge of a large quantity of limpid urine, or of a sweet-tasting fluid containing sugar, sometimes in large proportions. When the quantity of either passed in the twenty-four hours exceeds the amount of liquid imbibed during the same period, the disease may be considered established. Diabetes is attended with emaciation, and general prostration of strength both bodily and mental, together with other symptoms of constitutional derangement.

(*a*) *In limpid diabetes*, in which the water is more or less clear and pale, but free from sugar, the *indications* are to avoid all substances which have a tendency to act on the kidneys, including, if possible, mental anxiety. Carriage-exercise or a sea-voyage will always be beneficial, especially the latter, which has a wonderful effect in many cases. Liquids should be given in moderation, but reducing them to less than a pint and a half per day will not be of service, as this is the proportion which the body really demands for the regular waste going on. Very often there is a tendency to the condition known as hysteria (see page 148), when steel in some form is almost sure to be required, and will often do good in the shape of the tincture of the sesquichloride. The stomach and bowels should be attended to, and if aperients are required, the decoction of aloes, or castor-oil, will be the best, Warm clothing (so as to avoid the sympathetic action on the kidneys of cold to the skin) is especially to be recommended, and warm-baths will often act beneficially if not repeated too often; nor should the patient remain in them long, or at a high temperature. A bath once, or at the outside twice a week, for ten minutes at a temperature of 98° Fahrenheit, will be the proper modium, together with flannel to the skin of the whole body, and plenty of upper-clothing on exposure to the air of our winters. The *diet* will depend greatly upon the state of the urine, and on that of the stomach also. If the former is very pale and thin, animal food is required; while if it is darker than usual, and especially if there is a cloud deposited on cooling, a diet of vegetables chiefly should be adopted. If the strength is pretty good, fermented liquids may be altogether avoided; but if low, porter or cold brandy and water in small quantities may be allowed with safety. The following *formulas* may be tried:—

Take of Diluted sulphuric acid, ʒj to ʒiss.
Decoction of yellow cinchona, ℥xss.
Compound tincture of bark, ℥j.

Mix, and give three table-spoonfuls three times a day;

Or, take of—
Diluted hydrochloric acid, ʒj.
Tincture of sesquichloride of iron, ʒiss.
Water, ℥viij.

Mix, and give two table-spoonfuls twice a day.

(*b*) *In diabetes attended with a secretion of sugar* (*diabetes mellitus*), the first point to be attended to is to improve the powers of the stomach, without which no treatment will be of permanent service. Next to this is the regulation of the *diet*, so that it shall not contain any sugar or even starch, which is easily converted into that substance. The first of these indications is carried out on the principles which will be found laid down under the section on the treatment of *dyspepsia*, since the unhealthy conditions of the stomach vary greatly in diabetes, and require all the consideration which is given under that head. With regard to the second head, the rules to be followed here are more simple, consisting in the regular and long-continued use of a diet composed of meat and wheaten bread, or, in bad cases, of meat and bread from which the starch has been almost entirely removed. This is called "gluten bread," and is composed of the article called *semola*, which was introduced by Mr. Bullock some years ago for this express purpose, though afterwards extended to others. The bread is made by his successors, Messrs. Perrins and Barnitt, of Conduit Street, and is admirably adapted for *diabetes*, being composed of pure gluten, mixed with as small a proportion of wheat flour as will suffice to make it into light and digestible bread. It is only fit for using as dry-toast or biscuit, being brittle and dry, but is very palatable nevertheless. If this cannot be obtained, stale bread of the ordinary make should be used in about equal proportions, *by weight*, with cooked fresh meat, which should be broiled or roasted. The beverage should be limited in quantity to about a pint and a-half per day, and should consist of weak beef-tea, or mutton-broth, or milk, or whey, which last is the best of all for the purpose. Fermented liquids of all kinds are unfit for use, as also are salines, nearly all of which act upon the kidneys when given in small doses. When the stomach digests its food pretty well, and, in spite of strict dieting as above described, the secretion still continues to such an extent as to cause a loss of flesh and strength, the combination of quinine and iron will often be of service, in the form of citrate, as follows:—

Take of Citrate of quinine and iron, ʒss to ʒj.
Tincture of matico, ʒij to ʒiij.
Water, ℥viiss.

Mix, and give two table-spoonfuls three times a day;

Or, take of—
Sulphate of quinine,
Sulphate of iron, ā gr. viij.
Diluted sulphuric acid, min. xij.
Tincture of ginger, ʒij.
Water, ℥viij.

Mix, and give two table-spoonfuls three times a day.

SECT. 4.—TREATMENT OF CONGESTION AND INFLAMMATION OF THE OTHER SECRETING GLANDS.

1378. MUMPS, being almost peculiar to childhood, is treated of at page 319, among the diseases of that age.

1379. SIMPLE INFLAMMATION OF THE PAROTID GLAND (page 107) is to be treated by leeching and the water-dressing (par. 953), together with low diet and a brisk aperient, followed, if necessary, by one or other of the antiphlogistic mixtures given at page 342. If, in spite of these remedies, matter should form, it must be let out as soon as possible, by a small opening with a lancet, so as to avoid the scar which follows an extensive abscess.

1380. THE TONSILS WHEN INFLAMED are either ulcerated or they form matter, or they become enlarged in substance, a state scientifically known as hypertrophy (see page 108).

(*a*) *In quinsy*, which is an abscess forming in the tonsil, great efforts must be made at the onset to procure resolution—that is, to prevent the formation of matter. For this purpose leeches should be applied to the throat in considerable numbers, according to the age and strength; and after they come off, as soon as the bleeding has ceased, if the swelling seems to be increasing, a blister may be applied with advantage. It must be remembered that here life is often at stake from the stoppage of the air-passage by the swelling, or from the suffocation produced by the sudden bursting of a large quinsy during sleep, when the bland matter readily finds its way into the air-tubes. Hence it is of vast importance, if possible, entirely to stop the formation of matter, or if that cannot be done, to limit the quantity by all the means in our power. In aid of the bleeding and blistering, other remedies which keep down inflammation may be adopted, such as tartar-emetic in nauseating doses, or mercurial purgatives, or both together, and when the quinsy is so large as to impede respiration, and there is no surgeon at hand to open it through the mouth, which is not a safe operation in unpractised hands, an emetic may be given with a view of causing it to burst by the straining which accompanies the act of vomiting. If, in spite of all these remedies, the abscess still continues entire, the patient must be propped up in bed, with his head forwards even during sleep, and he should be closely watched, so that as soon as the matter escapes he may be roused to exert his powers in getting rid of it through the mouth. Very often it will require a considerable degree of this rousing before he can be made aware of what is required of him; because nature is by that time worn out, and the sleep is that of exhaustion, but a good blow with the palm of the hand, between the shoulders, will usually have the desired effect. The *formulas* required will be found at page 409, avoiding the calomel and opium, which are not required here.

(*b*) *Ulcerated sore throat*, in which the tonsils chiefly are implicated, when of the ordinary character, and not complicated with any impure disease, must be treated as follows:—In the first place, the bowels should be cleaned out by a brisk aperient, combining with it generally a dose of calomel or blue pill. Then, if there is any great inflammation and swelling, apply a blister externally on each side the throat, and internally brush the ulcerated surface twice a day with one or other of the following lotions, which must be applied by means of a large camel-hair brush, or a piece of soft sponge fastened on a short handle:—

Take of Nitrate of silver, gr. x to xx.
Distilled water, ℥j.
Mix, and use as a solution;

Or, take of—
Chloride of zinc, gr. ij to iij.
Water, ℥j.

Mix, and use instead of the above. As soon as the ulceration fills up by healthy granulations, the lotion may be discontinued.

(*c*) *Hypertrophy, or chronic enlargement of the tonsils*, is a most difficult disease to get rid of without the use of the knife, which is beyond the domain of our present subject. By improving the general health, which is almost always impaired, some considerable amount of good may be done, but the tonsils will almost always require something more than this; and nothing answers so well as the nitrate of silver or sulphate of copper in solution, which may alternately be applied by means of a brush two or three times a day, of the following strength. It will not be necessary to pass the brush *down* the throat into the opening to the larynx, but *upwards* and backwards, on and between, the enlarged tonsils themselves.

Take of Nitrate of silver, gr. xx to xxx.
Distilled water, ℥j.
Mix, and form a lotion.

Take of Sulphate of copper, ʒj.
Water, ℥j.

Mix, and form a lotion.

(*d*) *The uvula is often hypertrophied and relaxed* together with the tonsils, or sometimes without that complication. The same treatment which is advised for the one will also relieve the other, both being amenable to excision by the knife as a last resource. The relaxation of the uvula is chiefly to be avoided in consequence of the irritation which it produces, as it hangs against the opening of the larynx, and from which chronic cough of a most troublesome character often results.

1381. WHEN THE THYROID BODY IS INFLAMED OR HYPERTROPHIED, or both, which is the most usual condition (see page 109), and the tumour called *bronchocele* or *goitre* is established, it is necessary to subdue the inflammation by the local abstraction of blood, and, at the same time, to give iodine internally, and to follow them by the use of the same drug externally. In many cases, where the disease is taken in good time, it will be unnecessary to apply leeches, and the iodine alone will effect a cure; but when there is a large *tender* tumour, it is better to begin by applying six or eight leeches two or three times, with intervals of a few days. After this has been done, and the water-dressing has been employed to keep up the beneficial effect of the loss of blood, the iodide of potassium may be used externally, or the tincture of iodine may be painted on, every other day, till the cuticle is blistered, when the application must be postponed for a few days, till it is sound enough to bear the irritation it produces. The following *formulas* may be tried, taking care to clear out the bowels with an aperient proportioned to the strength of the patient, previous to commencing them:—

Take of Iodide of potassium, ʒj.
Lard, ℥j.

Mix, and form an ointment to be rubbed in night and morning over the tumour;

Or, brush over it the tincture of iodine daily, or every other day.

Take of Iodide of potassium, ʒss.
Tincture of iodine, min. xl.
,, cardamoms, ℥ss.
Camphor mixture, ℥viiss.

Mix, and give two table-spoonfuls three times a day.

1382. THE TREATMENT OF INFLAMMATIONS OF THE FEMALE BREAST is included under the 23rd chap., *on the Diseases peculiar to Women.*

1383. IN ACUTE INFLAMMATION OF THE TESTICLE, or *swelled testicle* as it is called, and which generally comes on in consequence of the irritation produced by impure discharge from the urethra, the most entire rest in the recumbent position must be strictly maintained. Leeches should be applied in considerable numbers (from eight to eighteen), and instead of a poultice, the plan of allowing the bites to bleed into flannel should be adopted (see page 259). After they cease to bleed, cold water may be applied to the part, and as soon as the bites are nearly healed a lotion of vinegar and water, with a little goulard extract, may be substituted for it. A dose of calomel (four to six grains) should be followed by the active aperient draught given at page 348; and as soon as the bowels are well acted on, and are beginning to get quiet, the stomach should be kept in a continual state of nausea, by means of tartar-emetic, in doses of a half or a quarter of a grain, taking care to let it be sufficient to produce considerable prostration. The following is the *formula* most likely to suit:—

Take of Tartar-emetic, gr. ij to iv.
Spirit of nitric ether, ʒiij.
Tincture of henbane, ʒij.
Camphor mixture, ℥viiss.

Mix, and give two table-spoonfuls every four hours. By adopting this method of treatment, the swelling almost always disappears in a few days; and after continuing the recumbent position for two or three days longer, with the cold lotion as above ordered and very low diet, the cure is complete. If these energetic measures are not adopted, the disease often runs on to a great length, and it may be months before the parts recover themselves.

(*a*) *When the testicle has been neglected*, and the inflammation has become *chronic*, or in some cases when it is so from the first, there is often great difficulty in getting rid of the enlargement. A suspensory bandage should be constantly worn, together with an evaporating lotion as follows, including within it a piece of old linen for the purpose:—

Take of Liquor of acetate of lead, ʒj.
Spirit of wine, ℥iss.
Vinegar, ℥j.
Camphor mixture, ℥ixss.
Tincture of arnica, ʒiss.

Mix, and apply as a lotion by means of linen. Small doses of mercury may be taken, combined with the iodide of potassium, as follows:—

Take of Calomel, gr. ss.
Extract of henbane, gr. ij.
Mix, and take every four hours.

Take of Iodide of potassium, ʒj.
Spirit of nitric ether, ʒiij.
Water, ℥viiss.

Mix, and take two table-spoonfuls with each pill as above. If in spite of this treatment the swelling continues, I know of no method likely to relieve it which is at all equal to the following ointment, but this has the disadvantage of giving most *intense pain* in the course of its action on the skin. It produces an enormous cellular swelling of an œdematous nature, and in that way probably relieves the inflammation; but, though it is quite safe from all danger, it should only be adopted by those who have strong nerves, and have no surgical aid at hand, in which case they may be ready to fly to any remedy, however otherwise objectionable:—

Take of red Iodide of mercury, ʒss.
Lard, ʒss.

Mix, and smear the skin of the part freely with it. In a few hours the whole surface will swell and become blistered. The pain may be allayed by warm fomentations; one application is generally sufficient to effect a cure, but a second may possibly be required at the end of a few weeks.

(*b*) *The watery swelling* of the testicle (*hydrocele*), which may be known by the bladder-like sensation which it gives to the hand, and by its transparency when a candle is held behind it in a dark room, can only be relieved by tapping, an operation which is of too dangerous a character for any one but a surgeon to attempt.

SECT. 5.—TREATMENT OF INFLAMMATION OF THE ABSORBENTS AND THEIR GLANDS.

1384. ACUTE INFLAMMATION OF THE ABSORBENTS themselves seldom shows itself, excepting when they are irritated by poisonous matter of some kind (see par. 336). In such a case it is necessary to apply leeches in considerable numbers along the red lines, which are seen leading upwards towards the body; and after the bleeding has ceased, to use an evaporating lotion as follows:—

Take of Tincture of arnica, ʒj.
Spirit of wine, ℥j.
Vinegar, ℥j.
Camphor mixture, ℥x.

Mix, and form a lotion, which is to be constantly applied to the inflamed part by means of linen rags. From three to six grains of calomel should be given, followed by an active aperient; and then it may be necessary either to give a lowering febrifuge, or else, in cases which appear to be assuming the typhoid form, bark and ammonia may be requisite; but these cases are of so ticklish a nature, that it is scarcely possible to give any useful directions to the domestic observer.

1385. IN ACUTE INFLAMMATION OF THE ABSORBENT GLANDS, as observed at page 110, there is generally an ulcer or sore of some kind present, the matter of which has been absorbed and carried into the gland where it has set up the existing inflammation. The most usual situations of these inflamed glands are the arm-pit or groin, in which latter place they are called *buboes*, and may either be the result of absorption from an inflamed ulcer on the feet, or as is very often the case, from a sore on the penis in the male, or in the vagina of the female. If the pain and swelling are great, leeches may be applied, together with a brisk aperient, low diet, and cold lotions; but generally matter will form in spite of all precautions, and in that case it is better to encourage its rapid formation, either by a poultice of linseed-meal, or by applying the following plaster spread on leather of a size somewhat larger than the swelling. It sticks very readily to the skin after the hairs are shaved off, and it may be kept on until the abscess breaks, when the matter will make its way under the edge of the plaster, which may afterwards be replaced, and when necessary, a fresh one may be applied. The following is the formula for this plaster, which is of great value in all glandular swellings:—

Take of The plaster of ammoniacum, with mercury,
Plaster of opium, equal parts.

Mix, and spread on leather with a warm spatula. There is seldom any good to be obtained by opening these abscesses with the knife, as they are almost always out of sight; but if active inflammation should occur in one of the glands of the neck, it should be opened as soon as possible to prevent a scar.

1386. Chronic Inflammation of the Absorbent Glands, being usually of a scrofulous character (see page 110), must be treated by tonic measures of a general character, together with local counter-irritants, such as hot brine, or the turpentine liniment, or the iodide of potassium, made into an ointment with lard, in the proportion of ʒj to ℥j of the latter. When there is a tendency to form matter, the treatment is the same as that described in the last paragraph for the acute form. This subject has, however, already been fully entered into under the head of the *Diseases of Childhood*, at page 324. The treatment of *diseased mesenteric glands* has also been described at page 325, as being peculiar to the age of *childhood*.

CHAP. XVI.

TREATMENT OF INFLAMMATION AND CONGESTION OF THE BRAIN AND NERVES.

1387. The form of Congestion of the Brain, which is dependent upon a defective quality of the blood supplied to that organ (see page 116), must be treated according to the nature of the depuration which is required.

(*a*) *Thus, if the congestion is owing to the poisonous influence of urea* in the blood, the remedy lies in stimulating the kidneys to secrete that substance to an extent sufficient to carry off the excess, according to the method laid down at page 446. For this purpose stimulant diuretics will be required united with digitalis, if the heart is over active, as is very often found to be the case, such as the following mixture:—

Take of Nitrate of potass, ʒij.
Spirit of nitric ether, ʒiij.
Spirit of juniper, ʒij.
Tincture of digitalis, ʒiss.
Infusion of horse-radish, ℥vij.

Mix, and give two table-spoonfuls three times a day.

(*b*) *When the congestion is owing to some defective state of the lungs or heart*, by which the blood is not properly purified of its carbon, as it passes through the former of these organs, the attention must be directed to the lungs or heart—that is to say, if the fault is of such a nature as to be remediable; but here the contrary is too often the case, and then all that can be done is to avoid distressing the circulation by any over-exertion of the body and mind which would aggravate the original mischief.

(c) *When bile is the cause of the congestion of the brain*, unless the liver is absolutely and permanently diseased, the treatment is generally simple enough, consisting in the application of the remedies which are employed for torpid liver, as described at page 441. When these have had the desired effect, the vessels of the brain recover their tone, and the congestion ceases, together with the accompanying disagreeable symptoms which are alluded to at page 116.

1388. THE CIRCULATION IN THE BRAIN OF A DEFECTIVE QUANTITY OF BLOOD, AS MANIFESTED IN WHAT IS CALLED FAINTING cannot, perhaps, be strictly considered as of the nature of congestion, though closely allied to it in its effects, which are a cessation of all mental manifestations or faculties, so that the whole body becomes, *for the time*, dead, with the exception of the circulation and respiration, which are carried on in the most languid manner, and, indeed, in extreme cases appear to cease altogether. The cause of this fainting is either directly or indirectly a defective action in the heart (see par. 350), and, therefore, the remedy consists in stimulating that organ, and, at the same time, in assisting it to do its duty, by lowering the head to a level with the heart, so that it will not have to drive the blood into it against the force of gravity. Diffusible stimulants, therefore, are given in a liquid form as well as in a gaseous condition, together with the stimulus of cold air or cold water, and sometimes the stimulus of necessity also.. Thus many a fainting fit is postponed for a considerable time, until some obstacle to its performance is removed, the mind being for a time capable of rousing the flagging organ to a performance of its functions. In the same way, in trifling cases, the plan of walking the patient about is often successful, which is quite contrary to the usual principles of affording relief, and which would fail most completely if tried in more urgent cases. The following directions may, however, be considered to be the most likely to succeed in the average of cases:—1st, Lay the patient flat on the floor, or place her in a chair with the head bent well forwards between the knees. 2nd. If cold water is at hand, sprinkle it with the finger and thumb against the face and neck, or in bad cases dash some of it with force against the face. A large fan, or any flat object used as such, will also give great relief. 3rd. Loosen all impediments to free breathing, such as stay-laces or petticoat-strings in the female sex, and cravats, collars, &c., in the male. 4th. Hold any *solid* smelling salts which may be at hand to the nose, *avoiding liquid solutions of ammonia*, &c., from a fear of their being poured into the larynx, and thus causing suffocation, an accident which has happened on several occasions. 5th. If there is the power of swallowing, give a tea-spoonful of sal-volatile in a wine-glass of water, or a small wine-glass of brandy, with double its volume of *hot* water, or a tea-spoonful of tincture of lavender in a wine-glass of water, or any other cordial which may be at hand. 6th. Let the patient lie still until the heart has recovered itself, and do not attempt to remove her for some little time.

1389. DELIRIUM TREMENS (see page 351) should never be treated by any one but the experienced physician, if it is possible to obtain his assistance, as it is a disease in which half-measures are very injurious, and a small dose of the proper remedy will sometimes occasion the absolute loss of life, when a large one would perhaps at once cut short the disease. But where such an unfortunate attack makes its appearance after a long debauch in a remote settlement, the lookers-on must do their best; and if they are quite satisfied that the disease is produced by *exhaustion after* drinking, and that it is not an actual inflammation resulting from the recent stimulus of spirituous liquors, they may at once proceed to give opium and ammonia in large doses, which alone are likely to be beneficial. The attendant must, therefore, carefully study the symptoms as described at page 117; and if satisfied that the case before him is really one of *delirium tremens*, let him proceed as follows:—In the first place, it will be prudent to ascertain that the liver and bowels are acting as they should do; and if it is found that no bile is passing, and the symptoms are not very urgent, it is better to give calomel or blue pill with mild aperients, until the state of the motions shows that the liver is acting. After this, or in the meantime if the case is urgent, the following draught may be given every four hours until sleep is produced, at the same time applying cold lotions constantly to the head, but taking care not to rouse the patient by them, if he is just "dropping off to sleep."

Take of Sal-volatile, min. xxx.
Tincture of opium, min. xxx to xl.
Camphor mixture, ℥j.
Mix, and form a draught to be given as above.

Take of Vinegar,
Spirit of wine, or brandy, or gin, &c., ā ℥iss.
Water, ℥ix.
Mix, and use constantly to the *shaved* head, by means of linen cloths dipped in it. A blister to the back of the neck may be applied as soon as the case shows itself, and it may be kept open by savine ointment, or by the blistering cerate which is sold for the purpose. When sleep has been produced, the opium may be discontinued for a few hours, and some good beef-tea, with a small portion of the alcoholic stimulant which has produced the attack, may be given, as for instance, a single glass of brandy and water or rum and water, as the case may be. This also is the time for acting on the liver or bowels as may be necessary, or on the kidneys by diuretics if they are torpid. At the end of twelve hours at farthest, it will be prudent to repeat the draught, and to give it again if necessary, proceeding as before if successful in procuring sleep. In a day or two a smaller dose of laudanum will perhaps succeed, and bark or quinine may be given during the day as ordered at par. 1127. The blister should be kept open until the brain is quite restored, the diet should gradually be changed for solid food, and the allowance of brandy, rum, or ale must be carefully reduced to the least which will suffice to keep up the proper amount of stimulus. At the same time the state of the bowels and stomach must be attended to, and the astringent effect of the opium must be counteracted by such aperients as will not exhaust, among which are included the compound decoction of aloes and rhubarb, either alone or in the shape of the compound rhubarb pill. Restraint by means of straight-waistcoats, &c., should, if possible, be avoided; but sometimes it is not safe to do without something of the kind, as, for instance, while the single attendant is sleeping; and then the two wrists may be fastened on each side the bed by the "clove-hitch," as described at page 421, cast in a strong silk handkerchief, and passed round them; after which the ends are easily rendered perfectly secure against any efforts which can be made by that hand, the other being widely separated from it by similar means.

1390. DETERMINATION OF BLOOD TO THE HEAD, or *active congestion of the brain* (see page 118), is a disease which it is very difficult to overcome by any of the ordinary resources of medical art. Sometimes, when it appears to depend upon the excessive use of the brain, a contrary plan, by which that organ is allowed partial or entire rest, will afford relief when it is practicable to carry it out. In many instances, however, the brain is so excitable that it will employ itself upon something, and then the attempt will fail because it *will* act somehow or other. Here all that can be done is to give general strength by fresh air with plenty of exercise, which should be long continued, but not violent; by which plan an amount of bodily fatigue is produced, which will cause a kind of mental as well as bodily lassitude, opposed to action of either body or mind. Shower-baths, and in some instances the douche, cautiously applied to the head (see page 205), will be of service, and may be given two or three times a day in warm weather, or once only during the winter season. A seton in the back of the neck is, perhaps, the most generally successful remedy, but the smell which it occasions makes it a most disagreeable one; nevertheless, in bad cases, it ought to be tried, and after it has been in action for a time, it will be found that bracing remedies may be used which previously increased the mischief. Aperient medicines which act on the large bowels have long been held in great estimation for their power over this kind of congestion, and especially the compound decoction of aloes, which may be given every night or morning in such doses as to procure a free evacuation; but the worst of this method of treatment is, that it weakens the tone of the stomach and bowels, and adds to the general irritability of the system, which, on the contrary, is wanted to be braced. I should, therefore, advise the use of the plan recommended at page 346 if the bowels are confined, together with the shower-bath or douche to the head, and plenty of slow walking-exercise, avoiding stooping and all violent exertions which set the heart acting, and thus increase the force of the circulation into the brain.

SECT. 2.—TREATMENT OF CONGESTION FROM PRESSURE.

1391. IN CONCUSSION OR STUNNING, when the circulation through the brain is congested from the effect of temporary pressure (see page 118), it is sometimes necessary, if the shock is very severe, to give stimulants (such as brandy or ammonia) until reaction takes place, which is known by returning consciousness, together with a rise in the force of the pulse. As soon as this has come on, the use of stimulants must be abandoned; and in slight shocks, nature will re-establish her usual condition after a short interval of confusion, accompanied perhaps by vomiting or nausea and some considerable giddiness and headache. When the first effects are gone off—that is, as soon as reaction is thoroughly established—it will almost always be prudent to give a smart dose of aperient medicine, to which calomel in strong constitutions is a most useful addition (see pages 347-8). Sometimes the reaction goes on to show symptoms of inflammation of the brain (see next sect.), and then the remedies there given must at once be adopted. At others, after the recovery from the *concussion*, symptoms of *compression* (see next par.) show themselves apparently from the effusion of serum or blood, and these also must be treated according to the directions there given.

1392. WHEN COMPRESSION OF THE BRAIN EXISTS IN THE ADULT (see page 118), it is caused either by bony pressure, or by the effusion of serum or blood in consequence of an accident, or as the result of inflammation or congestion from disease. Each of these, therefore, must be separately considered.

(*a*) *Compression of the brain arising from* a piece of bone being driven by force into it shows itself at once immediately after the accident, the symptoms being those of apoplexy (par. 355), and the treatment consisting in the abstraction of blood *as soon as reaction from the shock is established*, prior to which it can do no good, and will probably extinguish the only chance of life which exists. When, therefore, there is reason to believe, after a severe injury to the head, that the brain is suffering compression from a fracture and depression of a portion of the skull, the *treatment* must consist, in the absence of surgical aid, of the following precautions:—*In the first place*, the return of blood from the head must be encouraged, by removing all neck-cloths, collars, &c. *Secondly*, sinking must be prevented by such doses of brandy or ammonia as will prevent it, *but no more than sufficient for the purpose*—that is to say, only enough to raise the pulse to its usual standard of strength. *Thirdly*, if the pulse rises above the usual standard, it must be reduced by bleeding, as well as by calomel and other active aperients. *Fourthly*, the head must be shaved, and cold lotions, with ice if possible, should be kept constantly on it, as soon as the heat of the scalp rises at all above the ordinary level, or even before that time, if the symptoms of compression are on the increase. *Fifthly*, counter-irritants of all kinds may be employed, such as blisters to the back of the neck or to the pit of the stomach. Mustard-plasters to the feet and legs, and a stimulating injection (par. 1138) may be thrown up into the rectum. Perfect rest must be enjoined; and if the power of swallowing remains, the lightest kind of farinaceous slops may alone be passed into the stomach. When the first urgent symptoms have passed away, and surgical aid cannot be obtained, the plan most likely to be of service is to give the following medicines, continuing the counter-irritation and the cold lotion to the head in a moderated degree, and without ice, which is only to be used when the heat of the scalp is excessive:—

Take of Calomel, gr. vj.
Sugar, gr. xxiv.

Mix, and divide into twelve powders, one to be put upon the tongue every six hours, and washed down by a dose of the following mixture:—

Take of Nitrate of potass, ʒiss.
Spirit of nitric ether, ʒiij.
Tincture of digitalis, ʒj.
Liquor of acetate of ammonia, ℥j.
Infusion of horse-radish, ℥viss.

Mix, and give two table-spoonfuls every six hours.

(*b*) *Where serum or blood are supposed to be extravasated as a consequence of a blow or fall*, the treatment must be similar to that described at (*a*). It may, however, be remarked that leeches to the head are often of service after the use of the lancet in relieving the pressure on the vessels of the brain.

(*c*) *In apoplexy, whether sanguineous or serous*, the symptoms and treatment are so similar to those which are associated with the results of accident, that the directions given above will also apply here. The reaction must in the same way be waited for, before bleeding can be safe, or even at all useful; and stimulants are here also frequently required to restore the action of the heart, which is rendered insensible to the usual stimulus of the blood by the mischief which has occurred in the brain. It must be remembered, however, that in apoplexy prior to its occurrence an effusion has already taken place, and consequently the remedies applied are directed to prevent an increase in its quantity, and afterwards to procure its re-absorption. Large bleedings are, therefore, useless, and if necessary at all, they should be small and often repeated; and for this purpose in domestic hands, leeches used daily, or even more frequently still, will be the most appropriate method of keeping down the circulation.

(*d*) *When paralysis occurs* as a consequence of pressure from any of the above states, it must be suffered to take its course, until the cause appears to be removed, excepting that in all cases provision must be made against any temporary evils arising from it. Thus, supposing that the bladder is paralysed, as it generally is in severe "strokes" or accidents to the head, it will be necessary to draw the urine off by the catheter at intervals of twelve hours; or when the limbs are lying useless, and the *fæces* pass involuntarily, care must be taken to avoid the occurrence of bed-sores by great cleanliness and frequent bathing with brandy and water, followed by starch powder applied dry. After a time, when the mischief in the brain seems to be at a stand-still, the paralysed nerves may be stimulated to act by friction with hot salt on the skin, or with the warm embrocation ordered at page 349. Setons or issues, or repeated blisters to the neighbourhood of the spine, will assist in getting rid of the mischief, and passive exercise in an open carriage, such as a bath-chair, as well as sea-air or fresh country air, will aid in giving tone to the general system by which the progress of recovery is materially accelerated. *Amusement* of the mind, without *excitement*, is also a great assistant in effecting the desired result; but, in this respect, the greatest care is necessary to avoid the latter extreme.

SECT. 3.—TREATMENT OF INFLAMMATION OF THE BRAIN.

1393. WHEN ACUTE INFLAMMATION OF THE BRAIN IS MADE OUT TO EXIST (see page 120), the most active measures must at once be employed to prevent the severe and fatal mischief to that organ which will soon ensue if left to itself. The treatment will, however, vary in the state of collapse, and for this reason the two stages must be separately considered.

(*a*) *In the early stage of excitement*, the principle to be acted on is to arrest the extraordinary flow of blood to the head by every possible means, and as rapidly as the remedies to be employed will permit. The *first thing* to be done is to take a large quantity of blood from the arm in a full stream, so as to cause a sensation of faintness, or in bad cases absolute fainting. This low condition of the circulation must be kept up for some days by the application of leeches to the head, or by a second bleeding if necessary, or by the other remedies mentioned if they have that effect in a sufficient degree. *Next* give a full dose of an active aperient, preceding it by five or six grains of calomel. The aperient will often fail, unless it is composed of the most powerful kind, such as the jalap-draught at page 348, or croton-oil in very obstinate cases. *When these remedies have had time to act*, it will be necessary still to keep down the circulation by small doses of calomel, combined with tartar-emetic, given in the same way as for the other inflammations of vital organs (see *Inflammation*, page 365), but avoiding opium, which would act prejudicially on the brain at this stage, and giving digitalis instead, with the view of restraining the action of the heart. The *formula*, therefore, should be as follows:—

Take of Calomel, gr. viij.
Tartar-emetic, gr. j.
Powdered digitalis, gr. ss.
Confection, enough to make eight pills,

one of which is to be given every four hours. While these pills are producing their effect on the general circulation, cold applications to the head will aid in restraining the local action, and may consist either of an evaporating lotion or of iced water applied *to the shaved head* by means of a bladder containing it. Blisters to the back of the neck will also be of service, and mustard-plasters or the warm embrocation under spongio-piline (page 349) applied to the abdomen, so as to cause considerable irritation, will give great relief. The *diet* must be of the lowest kind, and should consist of slops only; and perfect rest of body, with the removal of all disturbing influences to the mind or senses, should be strictly enforced. As soon as there is reason to believe that the inflammation is subsiding, the doses of the calomel, tartar-emetic, and digitalis may be lessened, and the intervals between them lengthened; but the counter-irritation should be increased, and a blister may be applied to the crown of the head as soon as it is safe to withdraw the cold lotions or ice. By these means it is to be hoped that relief may be afforded, or if not the attack goes on to the next stage.

(*b*) *In the collapse after severe inflammation of the brain*, the pulse is generally so low as to forbid the continued use of depressing measures; and the attention must be confined to the external use of blisters, &c., together with the internal exhibition of nourishing food, and in extreme cases of stimulants, such as brandy or ammonia. Where many nights have been passed without sleep, and the exhaustion is consequently great, a full dose of opium is sometimes the only remedy which will prevent death; and it is, therefore, often given by the physician of experience, but the proper time for its employment is so difficult to detect, that it is scarcely advisable for any ordinary person to resort to its use in this disease, excepting under extraordinary circumstances, where death appears to be imminent, and where medical aid is wholly out of the question. Here the following draught may be tried; and, if it fails to procure sleep, it may be repeated every second hour until that result has been obtained:—

Take of Tincture of opium, min. xxx.
Sal-volatile, min. xl.
Camphor mixture, ℥j.

Mix, and form a draught. If this succeeds in procuring the much coveted sleep, a recovery may be hoped for in spite of the great prostration which exists. For some hours afterwards no attempt should be made to do more than support the strength by beef-tea, bark, ammonia, &c.; and then, if there is no sleep, the draught must be repeated, but as soon as possible the quantity of opium should be diminished, and in course of time, if a recovery takes place, it may be dispensed with.

(c) *In the convalescence* from this terrible disease, the most careful supervision must be kept up both over the mind and the body, lest any excess in diet should be committed, or any unnecessary mental excitement should be occasioned. It is generally requisite to keep the bowels gently acting for some time, even if stimulants and tonics are employed; while shower-baths, or ordinary cold applications to the head, may be used on the slightest manifestation of heat or excitement about the head. Farther than this it is seldom necessary to go at this stage, unless a relapse should take place; but it may be mentioned, that some kind of counter-irritation should be cautiously kept up until the health is thoroughly re-established.

1394. Chronic Inflammation of the Brain is so obscure in its symptoms, and so little under medical control, that it is wholly useless to attempt to go into the treatment proper for the several kinds of it, which are detailed at page 120. If it is suspected that any of these conditions exists, no harm can ensue from the attention to any disturbance of the liver or kidneys which may co-exist; nor will blisters, setons, or issues be likely to be mischievous; but beyond these remedies it is absurd for any ordinary observer to attempt to treat this disease.

1395. Hydrocephalus is included among the diseases of childhood, and is treated of at page 320.

Sect. 4.—Treatment of the Effects of Inflammation and Congestion of the Brain.

Sub-Sect. A.—Treatment of Paralysis of the Nerves of Sensation and Motion.

1396. Paralysis, or Palsy (see page 124), is explained as consisting of, or being divided into, various kinds, which are first classed in two great sections—namely, *paralysis of the nerves of sensation*, and *paralysis of the nerves of motion*, and are treated as follows:—

1397. Paralysis of the Nerves of Sight, commonly called *amaurosis*, and of the nerves of hearing (*deafness*), as well as those of taste and smell, will be included among the *Diseases of the Eye, Ear, Mouth, &c.* (See Part II., chap. 22).

1398. The Treatment of Paralysis of the Superficial Nerves of Sensation—namely, those of touch or those giving sensibility to the general surface—must depend entirely upon the view taken of the cause within the brain which has produced the disease. This is so obscure that it is scarcely possible to give any useful information on the subject; but in most cases it may be prudent, in the failure of all medical aid, to blister the back of the neck, and attend to the general health, at the same time keeping the bowels gently open, and avoiding all unnecessary stimulants. Beyond this it is useless to attempt any treatment.

1399. Paralysis of the Nerves of Motion (see page 125) may be exhibited in various parts of the body, viz., in the face alone, or in the one side of the body (*hemiplegia*), or as *paraplegia*, which is confined to the lower half. Sometimes, indeed, but not very frequently, it extends to the whole of the voluntary muscles below the head.

(a) *Hemiplegia*, or *paralysis of the*

lateral half of the body, indicates mischief of some kind, occurring in the opposite side of the brain. The disease which has caused it is generally effusion of blood or serum, producing in the first instance "a stroke of apoplexy;" and unless this effusion is got rid of, it is useless to attempt to relieve the effect. Hence it is necessary, first of all, to treat the case according to the method laid down for the management of apoplexy, and afterwards it may be possible to restore the nerves to a healthy condition by frictions with the naked hand, or with the hair-glove or flesh-brush, or even by slight galvanic currents given off by the apparatus contrived for the purpose. A case of this kind should not be despaired of for months, as it is astonishing to see the recoveries which are sometimes made from the most severe "strokes," if care is taken to avoid reducing the strength too much, and if the limbs are well rubbed many times a day after the cause is removed.

(*b*) *Paraplegia* indicates some mischief in the spine, and its onset is often very insidious, unless it is the result of accident. Issues or setons in the loins are the most likely measures to afford relief, and should be persevered in for a great length of time, though the proportion of recoveries is very small in this affection.

(*c*) *Paralysis of the nerves of one side of the face* is only an incipient form of hemiplegia, and is to be treated in the same way.

(*d*) *Wrist-drop*, or paralysis of the extensor muscles of the hand, being connected with the absorption of lead, requires all chance of a further amount of poisoning to be cut off. When the general symptoms of poisoning by lead have disappeared, the hand must be kept extended upon a splint, by means of a bandage *lightly* applied, and, through it, the muscles of the outside of the fore-arm should be well rubbed three or four times a day. The douche may also be applied to the arm with good effect, beginning with tepid water, and gradually lowering the temperature, until the water is used at the temperature of the surrounding air. Galvanism is often resorted to; but the douche and friction are the most powerful remedies.

(*e*) *Strychnia* is of great service in all these forms of palsy, when the original disease has disappeared; but it is too dangerous a medicine to be entrusted to any but the experienced medical attendant.

1400. SHAKING PALSY (page 125) can seldom be much relieved by any measures which can be adopted; but recourse may be had to general tonics, especially bark and ammonia, together with an opiate at night, if there is much difficulty in procuring sleep.

SUB-SECT. B.—TREATMENT OF THE VARIOUS KINDS OF HEADACHE.

1401. THE VARIOUS KINDS OF HEADACHE are enumerated and described at pages 125 and 126, as consisting of the *rheumatic*, *congestive*, *dyspeptic* or *sympathetic*, *periodic*, and *organic* forms of headache.

(*a*) *In the rheumatic headache*, the symptoms of which are given at par. 373, the *treatment* must be conducted on the principles alluded to under the head of chronic rheumatism at page 416, and the medicines there given will be often successful. Sometimes a ten-grain dose of the compound powder of ipecacuanha at night will afford great relief, the other remedies being given during the day. A flannel cap worn at night will also be found to ease the pain in many cases, especially in the winter season; and, lastly, when all other remedies fail, the following lotion may be tried, rubbing it in over the seat of the pain, and *at once* covering up the head with the flannel cap. In some few instances, I have tried a cap of spongio-piline made to fit the head, and sprinkling it with the lotion before putting it on; and it has been of great use in this troublesome and very common form of headache:—

Take of Camphorated spirit of wine,
ʒiss.
Liquor of ammonia, ʒij.
Tincture of opium, ʒij.
Mix, and apply to the head as above

directed. If the colour of the laudanum is objected to, five grains of acetate of morphine may be added instead.

(*b*) *Congestive headache* is relieved by measures which are suited to the three different conditions alluded to at page 126. In the *plethoric*, cupping at the back of the neck, or leeches to the temples, or a blister or seton in the back of the neck will be most serviceable, together with the regular use of mild aperients, such as the compound decoction of aloes, or the rhubarb and ipecacuanha pills, described at page 317. *In those of an irritable temperament* the mind must be kept as free from care as possible, and the body must be strengthened by steel, fresh air, and moderate exercise, together with a nourishing diet and attention to the stomach. The "water cure" is of the greatest service in these cases, and will often be found to be invaluable in giving tone to the nervous system. Lastly, *in the feeble brain*, sedatives and tonics, such as quinine and conium combined as follows, will be most probably successful :—

Take of Sulphate of quinine, gr. xij.
Extract of conium, gr. xxiv.

Mix, and divide into twelve pills, one of which is to be given three times a day.

(*c*) *In the dyspeptic or sympathetic headache*, the treatment must be of such a nature as to restore the tone of the stomach and bowels by the carrying out of the rules laid down under the head of *Dyspepsia* (see chap. 19). In *sick-headache*, however, which is generally confined to the first half of life, very little can be done by any means; and the only consolation which can be afforded is, that in course of time the attacks gradually disappear. Large doses of quinine have been found to keep them off for a time; but at last they have failed in every case where I have known them tried. Aperients seem to be wholly useless, and, indeed, it may be said, that all the resources of medicine have been tried in vain.

(*d*) *Periodic headache*, or *browache*, or *neuralgia of the head* (see page 127), will almost always give way to quinine in full doses, or to quinine and arsenic combined. The first thing to be done is to see that the secretions from the liver, bowels, and kidneys are in good order; and, if otherwise, they must be regulated by the treatment laid down under the various heads to which they are referred. Then begin by trying the sulphate of quinine, and it will often be desirable to combine some conium or hyoscyamus with it. Thus—

Take of Sulphate of quinine, gr. xxiv.
Extract of conium, gr. xviij.

Mix, and divide into twelve pills, one of which is to be given three times a day. Should this fail to afford the necessary relief, arsenic may be tried in combination with decoction of yellow bark. Thus—

Take of Fowler's solution of arsenic, min. xl.
Compound tincture of bark, ℥j.
Decoction of yellow bark, ℥xj.

Mix, and give three table-spoonfuls three times a day.

(*e*) *Headache from organic disease* is wholly beyond the reach of medicine, as far as obtaining a cure is concerned; but sedatives, such as opium and conium, will sometimes palliate the intolerable pain which exists in this form. In fact, if it were possible to ascertain with certainty that the disease is of an organic nature, no harm could accrue from resorting to any remedies which would relieve the pain, however powerful and otherwise dangerous they might be; but, as it is not, the unfortunate patient must content himself with such moderate doses as will not be injurious to health under ordinary circumstances.

SECT. 5.—TREATMENT OF INFLAMMATION AND CONGESTION OF THE SPINAL CORD.

1402. WHEN THE SPINAL CORD IS PASSIVELY CONGESTED OR INFLAMED (see page 127), there is seldom much benefit to be derived from general bleeding, or other lowering measures, which are applicable in inflammation of other parts. The *treatment* should be confined to mild aperients with an occasional dose of calomel, and leeches, blisters, issues, or setons to the part where the pain is experienced. The spine must be rested by the recumbent position, and great pains must be taken, if there is paralysis of the bladder, to relieve it at short intervals. If there is a tendency to rheumatism or gout, medicines calculated to remove those affections may be tried (see *Gout* and *Rheumatism*, pages 413, 415); or if the constitution is of a scrofulous nature, then the remedies which will be found described as adapted for that complaint may be substituted, using counter-irritation to the spine at the same time (see page 327).

1403. Active Congestion of the Cord or Spinal Irritation (see page 128) is to be treated by leeches and counter-irritants as ordered in the last paragraph, together with such general measures as will give tone to the system. If the health is at a low ebb, leeches can seldom be borne; but blisters or stimulating embrocations in very feeble subjects may be employed. Steel will generally be required, and the form which will be most likely to agree is that combined as follows:—

Take of Citrate of quinine and iron, gr. xl.
Bicarbonate of soda, ʒiij.
Tincture of henbane, ʒij.
Syrup of orange-peel, ʒij.
Water, ℥viiss.

Mix, and give two table-spoonfuls three times a day, with one of lemon-juice.

1404. Effusion of Blood or Serum in the Spinal Canal, if it can be detected during life, is to be treated in the same way as inflammation (see par. 1402).

Sect. 6.—Treatment of the various Congestions and Inflammations of the Nerves.

1405. Neuralgia (page 128) being almost always dependent upon some cause distinct from the nerves in which it is displayed, the *treatment* of it must be guided by the view which is taken of that cause. Thus if, as is so often the case, it appears to depend upon some defective assimilation of the blood owing to imperfect digestion, the remedy is to be applied to the stomach; and then in course of time, when success has followed it, the blood becomes properly nourished, and the nerve recovers its tone. On the other hand, if the pain in a particular nerve is due to pressure upon some part of its course, either external to the spine or within it, the only chance of relief lies in the removal of the pressure by such remedies as will effect absorption, such as mercury or iodine. These last are, however, rare cases, and the domestic observer must be careful how he proceeds upon this hypothesis, as the treatment will be prejudicial to the condition which exists when the stomach is alone in fault. The most feasible plan to be adopted is to examine first into the state of the stomach, bowels, and liver, and if they are deranged, to set to work and restore them by all the means which are calculated for that purpose (see *Dyspepsia* and *Congestion of the Liver*). Then, if the neuralgia remains, tonics, stomachics, and especially steel, together with the mildest kinds of sedatives, may be tried, with a view to brace, and yet soothe, the nerves; while cold-sponging or sea-bathing, or in some cases hot sea-water baths, will be found to restore the skin to a healthy state, acting upon its nerves by the stimulus which cold sea-water in particular affords. The carbonate of iron is considered to exert an especial influence over neuralgia; but I confess I have never found it of more service than the other salts of that metal. There is, however, always a great uncertainty in the power of remedies over neuralgia; and when once the stomach is set to rights, and this is not followed by recovery, any of the following prescriptions may be tried:—

Take of Sulphate of iron,
,, quinine, ā gr. xij.
Extract of conium, gr. xxiv.

Mix, and divide into twelve pills, one to be taken three times a day;

Or, take of—

Carbonate of iron, ℥j.
Acetate of morphia, gr. iss.

Mix, and divide into twelve powders, one of which is to be taken thrice a day;

Or, take of—

Sulphate of zinc, gr. xxiv.
Creasote, min. xxxvj.
Tincture of henbane, ʒiiss.
Camphor mixture, ℥viiss.

Mix, and give two table-spoonfuls three times a day.

(*a*) *Neuralgia* occurring in any part of the body, is always to be treated on the above principles.

(*b*) *Neuralgia of the face* (*tic douloureux*) is also to be met with the remedies mentioned above; but the preparations of iron seem here to exercise more control than in the ordinary forms of the disease.

(*c*) *Sciatica*, which is a species of neuralgia, may be relieved by local remedies more frequently than by those given for the improvement of the general health. Nevertheless, a combination of the two will be the proper method of treatment. The strong stimulating opiate embrocation ordered at page 349, if applied beneath spongio-piline as there directed, will seldom fail in giving relief.

1406. TETANUS, OR LOCKED-JAW (see page 129) is a most fatal disease, even under skilful treatment, and, therefore, it is scarcely to be expected that the ordinary attendant will be able to effect a cure. Nevertheless, in case of necessity, he may try what can be done, and with this view the following directions are given. A strong purgative of turpentine and castor-oil should be used, consisting of an ounce of each mixed, and passed through the closed mouth, if the jaw is locked, by the extraction of a tooth, or by forcing it open if that is capable of being done. If this fails to act, another dose should be given, with the addition of one or two drops of croton-oil, and as soon as the bowels are freely moved, the following mixture may be employed:—

Take of Turpentine, ℥j.
Mixture of acacia, ℥iss.
Tincture of opium, ʒiij.
Camphor mixture, ℥v.

Mix, and give two table-spoonfuls three times a day. Cold affusion may be tried to the spine and head, by pouring water, as cold as it can be procured, from a height along the course of the spine and over the back of the head. It is a remedy of great power, and reduces the action of the heart very rapidly, so that the pulse must be watched carefully during its use, and the water must be discontinued as soon as it falls in a dangerous degree. A common watering-pot without the rose is the most convenient instrument for applying the stream of water, holding the pot some feet above the level of the body. The inhalation of chloroform relieves the horrible spasms of the muscles, and sends the patient off to sleep; but it does nothing towards the cure, and is, therefore, of no service, except as a palliative of the pain experienced. Bleeding in plethoric subjects may be tried, or leeching, or cupping to the spine, or blisters along its course. Indian hemp has also been used with good effect in the tetanus of tropical climates. It is given in doses of two or three grains every three or four hours.

1407. IN HYDROPHOBIA (page 385), when occurring in the human subject, there is even less hope than in tetanus. Still, when such a disease shows itself at a distance from medical aid, something must be done; and it appears probable, from its effect on a case at King's College Hospital in 1842, that cold affusion, as ordered for tetanus in the last paragraph, may exercise some control over the disease. It is also the remedy which is most likely to be at hand, and I should strongly advise its being tried under the above circumstances, carrying it to the extent of reducing the pulse to a low ebb, but taking care not to go so far as actually to destroy life.

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CHAP. XVII.

TREATMENT OF CHRONIC DISEASES OF THE BLOOD, AND OF THE VESSELS WHICH CONTAIN IT.

SECT. 1.—TREATMENT OF PLETHORA.

1408. THE TREATMENT OF PLETHORA, AS OCCURRING IN THE CHILD, is alluded to at page 322.

1409. PLETHORA IN THE ADULT (page 131) must often be treated by far more energetic measures than those which are recommended for the same state in childhood, because it may lead in the adult to organic disease of some vital organ, and, moreover, because it is so difficult to limit the extent which will afford sufficient relief. *In ordinary cases* it will be the proper plan of proceeding (if only it can be carried out) to cut off the supplies of blood, by diminishing the quantity and lowering the quality of the food, confining the patient to a spare vegetable diet, with only such an amount of animal food as will keep his stomach in good order. If the bowels are at all confined, aperients may be employed; and of these none answer so well for our present purpose as the rhubarb and ipecacuanha pills, as directed to be given regularly at page 347. With their aid in considerable numbers, the food may be much more liberal than without them, because it is carried on from the stomach and small intestines before the absorbents have had time to fill themselves with its most nourishing particles. *In very threatening cases* of plethora, however, something more than this is required, and general or local bleeding must be practised, especially where there is congestion of the brain, or of either of the other important organs of secretion, such as the liver or kidneys. For those who will not submit to the above limitation in point of diet, and refuse to exert themselves in taking proper exercise, there is no remedy so useful as a seton, because it affords a constant drain upon the blood, without removing its most essentially vital elements, or doing the injury to the health which aperients are guilty of. It is true that it is loathsome from its smell, if not kept scrupulously clean; but by great care this annoyance may be avoided, and in practice there is no doubt that a seton may be made to discharge without at the same moment offending a nose of ordinary acuteness.

SECT. 2.—TREATMENT OF ANŒMIA AND CHLOROSIS.

1410. ANŒMIA (see page 132) being dependent upon a deficiency in the red particles of the blood, and these being furnished by the digestive organs with the aid of those of assimilation, it is manifest that in *treating* the disease, our endeavours must be directed to improve and give tone to the several organs which are in fault—viz., the stomach, liver, heart, and lungs, all of which are concerned in the proper formation and purification of the blood (see article *Blood* in Part III.) We know by experience, as well as from a chemical examination of its composition, that the presence of iron is essential to the due development of these red particles; and, therefore, when we find they are insufficient in numbers, we give that metal in some shape so as to assist the secreting organs in the task they have to perform, since they would otherwise have to obtain it from the food, in which it is present only in very minute quantities. But it is useless to attempt to drive iron into the blood by main force, because, unless the stomach and intestines are strengthened, and their mucous membrane is in a healthy state, the iron will not be absorbed, but will pass on and be discharged. Hence it is incumbent to give stomachics, together with exercise in the fresh air, and at the same time to present a moderate quantity of iron in the least nauseous shape to the absorbents *at the time when the food is converted into* *chyme, and ready to be forced out of the stomach* into the intestines, to receive the last touch of digestion before it is absorbed. If the iron is given in a form which will displease the nerves of the stomach, or if it is in too large doses, the digestive process is upset, and more harm than good is done by the attempt. It has been supposed that iron might be best given by making it up with the bread; but this is quite unnecessary in practice, and even theoretically wrong. It must be remembered that iron *is not digestible*, and therefore it remains doing nothing in the stomach during the two or three hours in which the food is being dissolved and converted into *chyme;* in fact, it is probably doing worse than nothing, for it may be offending that organ by its presence. The proper time to give steel medicines is the period just before the products of digestion are going to leave the stomach, so as to allow it to mix with them and pass off without notice. If it is postponed longer than this, it is taken into an empty stomach, and is kept there until the *chyle* is absorbed from the small intestines, where its presence is delayed until too late. *The principles of treatment* may, therefore, be considered to be twofold—1st, to take care that the stomach, liver, heart, and lungs are in good working order, and that they are kept so by proper medicine if necessary, as well as by diet, exercise, and fresh air; and, 2nd, to present iron to the stomach in the least objectionable form about two or three hours after each meal. It is found that the citrate of quinine and iron is a capital combination in the case of anœmia, the quinine bracing the stomach, and the iron being in a form which is easily absorbed. This salt has also the advantage of being readily taken in a state of effervescence, which is grateful to most stomachs, and the carbonic acid given off is often in itself a stomachic. With this view the following *formula* has been used most successfully by Dr. Watson, as well as by others who have imitated his example:—

Take of Citrate of quinine and iron,
gr. xl.
Bicarbonate of soda, ʒiij.
Tincture of cardamoms,
Syrup of orange peel, ā ʒij.
Water, ℥viiss.

Mix, and give two table-spoonfuls three times a day with one of lemon-juice;

Or, take of—
Wine of iron, ʒij.
Comp. tincture of valerian, ʒvj.
Water, ℥vij.

Mix, and give two table-spoonfuls three times a day;

Or, take of—
Carbonate of iron, ʒj.

and divide into twelve powders, one of which is to be given three times a day;

Or, take of—
Sulphate of iron, gr. viij to xij.
Infusion of calumba, ℥viiss.
Tincture of orange peel, ℥ss.

Mix, and give two table-spoonfuls three times a day.

1411. CHLOROSIS (see page 132) never being dependent upon loss of blood like anœmia, but being purely a disease of the organs which form that fluid, it is more particularly necessary to attend to their condition, and to give tone to their nerves, as well as to present iron in some shape to the absorbents, in the same way as is recommended for anœmia (see last par.). Hence, pure air and exercise, either on foot, on horseback, or in a carriage, are both essential to the treatment; and without them, although the constitution may rally for a time, yet the relief is only temporary, and in the course of a few weeks, some organic disease of the heart, or very frequently of the kidneys, shews itself. The functions of the womb are seldom properly carried on in chlorosis, and this is frequently considered to be the essential feature of the disease, whereas it is only a consequence of the want of proper material for the vessels to secrete at the regular periods. Hence it is a fatal mistake to attempt to restore this secretion, while the blood is still thin and watery, and the cheeks sallow and pale. The first thing to be done is to increase the supply of healthy blood, and by no means to hope even for the return of menstruation until the blood from which it is produced can be spared. Any of the preparations of iron mentioned in the last paragraph may be tried with advantage; but it is of great importance to take care that the liver and bowels are acting properly, and for this reason the combination of a mild aperient with the iron is often very advantageous. This dose must, however, be only occasionally administered—that is, not for many days together, and solely with a view to renovate the digestion, and not with the hope of acting on the womb, as in those cases of defective menstruation where purgatives are given with advantage (see *Diseases of Women*). The following *formulas* are particularly applicable:—

Take of Sulphate of iron, gr. viij.
,, magnesia, ʒij to ʒiij.
Infusion of columba, ℥vij.
Tincture of orange peel, ℥ss.

Mix, and give two table-spoonfuls twice a day;

Or, take of—

Pill of iron with myrrh, ʒiss.
Compound aloetic pill, ʒss.

Mix, and give one or two pills three times a day. The above may be used for a week or ten days, alternately with any of the prescriptions given in the last paragraph, especially that containing the citrate of iron and quinine.

SECT. 3.—TREATMENT OF CACHEXIA AND SCROFULA.

1412. CACHEXIA (see page 133) being defined to be a *bad habit of body, together with a tendency to biliary derangement*, it becomes imperative here to attend to the organs which are in fault, by giving such medicines as will restore their functions; while, at the same time, fresh air, exercise, and proper food are also to be considered as essential to the cure. If tubercles are present, the *treatment* must be modified accordingly (see *Tubercle*); but in all cases the greatest attention must be paid to the points mentioned above, without which it is hopeless to attempt to give relief to any local complication. Cachexy chiefly occurs in large towns, and hence it is reasonable to suppose that a removal to fresh country-air or sea-air will of itself be sufficient, and such is very often the case; while a short sea-voyage may be said to be almost a specific in the early stage of the disease, partly from the change of air and scene, and partly from its peculiar effect upon the digestive organs. Mental occupation of a cheerful character aids the other remedies very considerably, and must not be lost sight of, especially in those of the male sex who are subject to this lowering disease. The *diet* should consist of the most digestible and nourishing articles, with a constant change and variety, and with the addition of fresh fruits when they can be obtained. Sarsaparilla is often of great service after the liver and stomach are so far renovated as to bear its presence, and the iodide of iron is also a very useful tonic. Small doses of mercury must often be given in the early stage, but should only be continued so long as the evacuations are shewn to be deficient in bile, after which the tonic given below will be more useful. The following will, therefore, be required:—

Take of The compound pill of the chloride of mercury, gr. v.

every night, or night and morning, until the liver acts sufficiently, together with the annexed mixture during the day:—

Take of Liquor of potass, ʒij.
Infusion of rhubarb or senna, ℥iss.
Spirit of nitric ether, ʒiij.
Infusion of gentian or cherayta, ℥vj.

Mix, and give two table-spoonfuls three times a day; afterwards begin the following:—

Take of Syrup of iodide of iron, ℥ss to ℥j.
Compound essence of sarsaparilla, ℥j.
Water, ℥vj.

Mix, and give two table-spoonfuls three times a day.

1413. THE TREATMENT OF SCROFULA, *as appearing in childhood*, has been entered into at great length at page 322, where the various forms known as—*the scrofulous constitution and tubercular deposits*, *scrofulous enlargement of the external glands*, *mesenteric disease*, *scrofulous disease of the joints*, *scrofulous abscesses*, and *spinal disease* are fully investigated; while scrofulous diseases of the eye and ear which are confined to childhood are alluded to at pages 332 and 333, and those of the skin will be found among the inflammations of that organ at all periods of life.

1414. TUBERCULAR CONSUMPTION (page 135), not being often developed to any extent in childhood, is not, therefore, included among the diseases of that period, except in so far as its seeds are concerned, in the shape of crude or unsoftened tubercles, which may sometimes be recognised as in existence, though the treatment in such a case would be confined to the improvement of the general health, without any reference to the local deposit (see pages 323 and 324). But in the adult this terrible disease is too often to be battled with, and though we may often be beaten in the endeavour to give relief, yet there are still many instances in which our hopes are crowned with success. The *treatment* will depend upon the state of the disease, viz., whether it is *incipient* or *confirmed.*

(*a*) *In incipient pulmonary consumption* (*phthisis*), when it is detected, which will generally require the diagnostic powers of an experienced physician, the attention must be directed to improve the health, by giving plenty of nourishing, yet digestible, food, fresh country air in a *warm climate* if possible, and moderate exercise, with amusing occupations. At the same time a combination of mercury and iodine may be rubbed into the chest, with the hope of procuring absorption of the tubercular matter, since both these remedies exercise considerable power over the absorbents. Whether such a termination of tubercle is possible must be doubtful, because it is so difficult to prove their prior existence in any case, when their absence is supposed to be due to this process; but at all events it is right to make the attempt, provided we incur no great risk of doing harm at the same time. Iodide of potassium may also be given internally, if it agrees; but as it seldom does in delicate subjects, it is not often of any service. Quinine and steel are much more likely to brace the system, and they may often be given, combined, with advantage. The *diet* should be chiefly of milk and farinaceous food, together with digestible vegetables, fish, poultry, and occasionally a small quantity of roast or boiled meat. Fermented liquors are not often desirable; but where the health is much reduced, a small quantity of fresh table-beer is of service. The *clothing* should be warm, and composed of flannel next the skin; but it is carrying this to extreme, when the amount of clothes is sufficient to keep up a constant state of perspiration. Nothing braces the system in the early stages of consumption more than cold water, which may be used daily, beginning with it in a tepid state, and gradually reducing the temperature. The friction with wet towels (see page 203) is the process which appears to be most beneficial, as it does not abstract much heat from the body, and yet braces the skin very completely. With regard to *exercise*, it must not be carried out to the extent of producing exhaustion, and carriage exercise should be employed during part of the day to give air and change of scene, the remainder being filled up with a walk, or ride on horseback. If there is any tendency to cough on going into the cold air, the "respirator" invented by Mr. Jeffreys may be used to the mouth; but it is only of advantage when the cough is violent, and should not be adopted without great necessity for it. *A change to a warm climate* supersedes this ingenious invention, and at this stage is of great utility; but unfortunately it is too often deferred until it is wholly useless, or even injurious, from the effect of heat upon the perspirations which occur in confirmed consumption. If the constitution is decidedly cachectic or scrofulous, the remedies which are suitable to each must be employed (see pages 322 and 469.) The annexed *formulas* are alluded to above:—

Take of red Iodide of mercury, ʒss. to ʒj.
Lard, ℥j.

Mix, and rub in a small piece on the chest every morning, shifting the application to fresh skin as soon as it has inflamed the part where it is first applied.

Take of Iodide of potassium, gr. xl.
Essence of sarsaparilla, ℥j.
Tincture of conium, ʒiss.
Water, ℥vij.

Mix, and give two table-spoonfuls three times a day;

Or, take of—
Citrate of quinine and iron, gr. xl.
Bicarbonate of soda, ʒiij.
Tincture of henbane, ʒij.
Syrup of orange peel, ʒij.
Water, ℥viiss.

Mix, and give two table-spoonfuls three times a day, with one of lemon-juice.

(*b*) *In confirmed phthisis*—that is to say, when the tubercles are softening or softened, and there are all or most of the symptoms enumerated at page 136—the *treatment* must be twofold. *In the first place*, attention must still be paid to the general health, which should not be sacrificed to any local mischief which may be going on, for we find that any strength lost by the employment of lowering measures is rarely regained. For this reason, then, it is incumbent to keep the attention fixed upon the organs of nutrition, which should not be sacrificed to the desire for the relief of the local mischief, through any effect of medicine upon the alimentary canal, when that effect is prejudicial to its tone. The same kind of *diet* as was advised in the last section may be continued; and if the flesh is much wasted, cod-liver oil may be employed in addition, in doses varying from a tea-spoonful to a table-spoonful three times a day. The effervescing steel mixture is a good vehicle for giving the oil, if the gas is allowed almost entirely to escape before it is added to each draught. Towards the latter stages of consumption, when the exhaustion is great, the oil is very useful, and by its means life is often prolonged for many months or even years; but excepting as a most nourishing kind of food, it is doubtful whether it has any curative power over consumption, though it is known to contain iodine in a definite proportion. But whatever may be the principles of its operation, there is no doubt of the fact that it is a most valuable agent in supporting the strength, and thus enabling the patient to bear up against the lowering effects of the disease, and of the remedies which are employed against it. But, besides this general treatment, a *second* and subsidiary plan of operation must be carefully kept in view, by which the progress of the tubercles may be arrested or checked, and the attendant inflammation prevented from attaining any great height. This is best done by local applications of leeches (when the pain on inspiration is considerable), or by counter-irritants, such as the biniodide of mercury ordered in the last paragraph, or the tartar-emetic ointment (one drachm to one ounce of lard), or small blisters frequently repeated, or the embrocation ordered at page 349 and used beneath spongio-piline. The heart is almost always irritable, and inclined to beat too rapidly for the safety of the lungs, and it should be kept down by the least deleterious medicines, such as prussic acid or digitalis, which, for this reason, will be found included in several of the formulas given below. If the expectoration is very profuse, the mineral acids, together with quinine in small doses and a mild anodyne, will be the best method of treatment; while in the dry cough so common in consumption, ipecacuanha may be ventured on when united with rhubarb and a mild stomachic. The turpentines and balsams sometimes afford relief; but there is scarcely any disease where there is more uncertainty in the action of remedies, and for this reason any of the mixtures ordered below may be tried in doubtful cases. Towards the last, when the exhaustion is great, stimulants will often be needed, together with opiates at night, and astringents to check the diarrhœa and profuse sweats, which are invariable attendants upon the disease at this period. The skin generally suffers from the pressure of the bones, which being very slightly protected by fat become sharp, and are then doubly likely to cause the bed-sores which are so distressing. The water or air cushion should, therefore, be used as soon as the redness of the skin is perceived; and by their aid, together with bathing with warm brandy, and dusting with starch powder, the actual occurrence of a slough may generally be prevented. *Change of air to a warm climate* is likely to be of great service in the early or incipient stage of consumption, as remarked in the last paragraph; but in the latter stage, it is seldom of any use, and often hastens the event which it was meant to postpone. Indeed, from the moment that diarrhœa and night-sweats make their appearance, it is decidedly injurious, from the tendency of heat to aggravate them. Prior to their appearance the change may be tried, and then the choice will, of course, be directed according to the circumstances connected with each particular case (see *Climate*). *Gentle exercise* should be continued as long as possible; and in the winter season, the effect of cold air upon the lungs may be obviated by the use of the respirator, either out of doors only or in any change of temperature, as, for instance, in passing from room to room. The following *formulas* are those which have been alluded to above:—

Take of Diluted sulphuric acid, ʒj.
Syrup of poppies, ʒiij.
Sulphate of quinine, gr. iv.
Tincture of digitalis, ʒj.
Infusion of roses, ℥viiss.

Mix, and give two table-spoonfuls three times a day. (*When the expectoration is at all profuse with a rapid pulse.*)

Or, take of—
Sulphate of quinine, gr. viij.
Tincture of opium, ʒj to ʒiss.
Diluted sulphuric acid, ʒss.
Water, ℥viiss.

Mix, and give two table-spoonfuls three times a day. (*When the expectoration is profuse, and the cough troublesome, but loose, without quickness of pulse.*)

Or, give the above with decoction of yellow bark instead of water;

Or, take of—
Syrup of tolu,
Tincture of tolu, ā ʒij.
Spirit of turpentine, ʒj to ʒiss.
Compound tincture of camphor, ʒvj.
Mixture of acacia, ℥j.
Camphor mixture, ℥vj.

Mix, and give two table-spoonfuls three times a day. (*When the cough is hard without much expectoration, and the pulse is feeble.*)

Or, take of—
Diluted hydrocyanic acid, min. xxiv.
Syrup of tolu, ʒiij.
Decoction of iceland moss, ℥viiss.

Mix, and give two table-spoonfuls three times a day. (*When the cough is not very troublesome, but the pulse is quick, and the strength requires increasing.*)

When the exhaustion is great towards the final stages—

Take of Tincture of opium, min. xx to xxx.
Sal-volatile, min. xxx to l.
Camphor mixture, ℥j.

Mix, and give as a draught in the latter stages, in order to procure sleep;

Or, take of—
Sesquicarbonate of ammonia, gr. xxx.
Mixture of ammoniacum, ℥vij.
Compound tincture of camphor, ℥j.

Mix, and give two table-spoonfuls three times a day. (*When the powers are so much reduced that there is scarcely strength to expectorate.*)

1415. ATROPHY, or *scrofulous dis-*

ease of the mesenteric glands, has been included among the *Diseases of Children* at page 325.

1416. TUBERCLES IN THE BRAIN being a disease which is not likely to be detected by the ordinary observer, it is of no use to give any directions for their treatment here.

1417. SCROFULOUS ULCERS AND ABSCESSES (including *psoas* and *lumbar abscess*), *scrofulous disease of the lymphatic glands, of the joints,* and *of the spine,* are all treated of at pages 322, 323, 324, 325, and 326, as chiefly occurring at the period of childhood.

SECT. 4.—TREATMENT OF CHRONIC DISEASES OF THE BLOOD-VESSELS.

SUB-SECT. A.—CHRONIC DISEASE OF THE ARTERIES.

1418. WHEN AN ANEURISM IS SUSPECTED TO EXIST, no time should be lost in obtaining surgical aid, and certainly no attempt should be made by any other person than the experienced surgeon to interfere in these diseases, whether they are the result of accident or otherwise. In the limbs, if an aneurism is discovered at a distance from all surgical aid, and if the tumour is rapidly increasing in size, a thick compress of folded linen may be put on, and by its means pressure may be kept up with the aid of a bandage, which must also be applied to the whole of the limb below, or there will be considerable swelling following the partial pressure at the locality of the aneurism. The compress and bandage may also be kept wet with cold water, by which the increased heat is avoided, which the bandage would otherwise promote. Beyond this use of pressure, and the employment of great care to prevent unnecessary exertion, nothing whatever should be done.

1419. ANEURISM BY ANASTOMOSIS AND NŒVUS should be also placed under the surgeon's care; but sometimes in his absence an alarming hemorrhage takes place from the ulceration of the skin over either of these, and the bursting of the coats of the distended vessels. In such a case pressure is the only available remedy, and it must at once be applied by means of the fingers upon a compress of linen until a bandage can be obtained and applied in a permanent manner. A piece of linen should be folded into a thick square a little larger than the diseased vessels, and the middle of this should be laid upon the ulcerated opening, placing the finger upon it, and holding it steadily and firmly down with such an amount of pressure as can be borne without pain, and as will command the bleeding entirely. This will allow time for obtaining a bandage, which must be long enough to encircle the limb several times, and then applying it with a proper degree of tightness, the part must be carefully watched until the surgeon arrives. If, however, the case is at a distance from all aid, the bandage and compress must be kept constantly applied until the ulcer heals firmly, using as little pressure as will serve the purpose of stopping the bleeding. Indeed, after the sore is thoroughly healed, it is always prudent to keep up some degree of pressure, in order to prevent a recurrence of the accident.

SUB-SECT. B.—TREATMENT OF CHRONIC DISEASE OF THE VEINS.

1420. VARICOSE VEINS (page 143), when, as is usually the case, they show themselves in the legs, must be kept from further enlargement, or from ulceration and bursting, by pressure applied all the way from the toes to the highest part of the enlargement. This may be effected either by a common bandage of calico, or by means of the elastic web, which is now made into the form of a stocking, and drawn over the naked skin beneath the usual covering. The only drawback to this material is that it is very hot, and is soon spoiled if kept wet, while the calico may be constantly moistened with water, or any cold lotion, if it is desirable to do so. If the elastic stocking is decided on, the measure of the leg must be taken round the instep, round the small of the leg, and round the calf, and also the length of the leg from the ground (when standing) to the lower edge of the knee-cap. These several measures should be distinctly written out for the instrument-maker, and he will then be sure to send a stocking that fits. If the varicose condition occurs in the spermatic vein, as it returns from the testicle, the disease is called *varicocele*, showing itself in a soft enlargement at the back of that organ, which goes down in the recumbent position, and for which there is no ordinary remedy but a suspensory bandage of the usual kind, together with the use of cold water to the hips and thighs every morning. There is an operation sometimes practised by the surgeon upon the veins of the leg when varicose, with the view of obliterating the canal entirely, and thus curing the disease; but it is, though sufficiently simple, of a very dangerous nature, and not fit for any person to attempt who is not practically accustomed to the operations of surgery.

1421. Piles or Hemorrhoids (page 143) require *general*, as well as *local*, treatment, and the latter may be only *palliative*, or it may be practised with a view to the *radical cure* of the complaint.

(*a*) *The general treatment* consists in preventing or removing all congestion of the liver, as well as the collections in the large bowels, both of which impede the return of blood from the veins of the lowest bowel, where the piles are situated. This treatment is necessary whether the piles are internal or external, and is to be carried out by first acting on the liver by means of the remedies proper to its particular condition (see *Congestion of the Liver*, page 441), and then taking care afterwards that the bowels are never loaded, and that the motions are soft, and, therefore, not of a consistency to injure the veins by mechanical pressure. For this purpose, the mildest aperients are desirable, and it is very common to combine with them certain remedies which appear to have a specific effect upon the veins, such as sulphur, copaiba-balsam, and spices, the last being generally used in the form known as "Ward's paste" or the confection of black pepper. But nothing answers better for this purpose than the mild aperient pills composed of rhubarb and ipecacuanha when given according to the method described at page 347; and if these are regularly taken so as to act freely on the liver and gently on the bowels, no other internal medicine will be required in most cases of piles. If, however, they are very obstinate, the annexed *formulas* may be tried:—

Take of Cream of tartar, ʒij
Sulphur, ℥ss to ℥j.
Powdered jalap, ʒij.
Powdered ginger, ʒj.
Confection of senna, ℥iij.
Syrup enough to make the mass into an electuary,

of which about a tea-spoonful is to be taken every night. (*Useful in most forms of piles.*)

Or, take of—
Balsam of copaiba, ʒiij.
Cream of tartar, ℥ss.
Powdered ginger, ʒj.
Confection of senna, ℥iij.

Mix, and give a small tea-spoonful every night. (*Useful in internal piles.*)

Or, take of Ward's paste, gr x. to xv. every night at bed-time. (*Very useful in old standing internal piles.*)

(*b*) *The local palliative treatment* consists—1st, in the injection of two or three ounces of cold water into the bowel just before the time of passing each motion, by which means the veins are constricted and partially emptied, and the bowel is also lubricated; every one subject to piles should adopt this plan whether they are external or internal; 2nd, in returning within the *anus*, by means of the finger, every little pile as it first shows itself, for if it is allowed to remain outside, it soon becomes strangulated by the pressure of the muscle closing the opening, and is then exquisitely painful and tender; 3rd, when there is great inflammation of these external piles, after they have been allowed to remain down, they should be freely bathed with a sponge and hot water every four hours, and as far as possible the recumbent position should be maintained until the inflammation has subsided. Leeches may be applied to the piles themselves if they are very much swollen and inflamed, and after them the fomentation with hot water may be had recourse to for a time, and then a linseed-meal poultice may be put on, retaining it by a handkerchief round the hips, and another passed between the legs from the back of it to the front; 4th, if there is inflammation of the internal piles, an opiate injection with sugar of lead will often relieve the pain, as follows:—

Take of Acetate of lead, gr. xxiv.
Purified opium, ʒss.
Boiling water, ℥viij.

Dissolve the opium and lead in the water and make a solution, of which half an ounce by measure (*and no more*) is to be thrown up into the bowel with a small syringe, immediately after the bowels are moved. It may be repeated at the end of twelve hours, if the first should be returned, but once in twenty-four hours is generally often enough to use such a powerful application. (*This should only be employed in very bad cases, or in cases where the bleeding from them is very profuse.*) Even in internal piles, leeches applied externally, and the bites allowed to bleed into a hip-bath containing warm water, will often give great relief, but the only permanently useful remedies are those employed internally (see *a*); 5th, when the first inflammation is allayed, or before it comes on, in the case of piles first shewing themselves, the application of the following astringent ointment will often contract the piles and afford the greatest relief:—

Take of Gallic acid, ʒj.
Powdered opium, ʒss.
Lard, ℥j.

Mix, and apply with the finger on the pile and lining membrane of the bowel, as far as it can be reached, night and morning.

(*c*) *The radical cure* of piles can only be effected by their removal, which may be managed either by the knife or by tying them with a strong thread or silk. The former of these operations should never be attempted by any one but the practical surgeon, because the risk of alarming hemorrhage is too great to be incurred, without the knowledge of the means to be used in checking it; but in those remote situations, where no surgical aid can be obtained, and where the presence of external piles renders life miserable, any one possessing good nerve and ordinary skill can remove them with a ligature. In this operation, however (after taking care to empty the bowel by an aperient), it is necessary to pass the ligature by means of a needle through the pile, or a part of it is sure to escape, and then dividing the two threads, one half is tied on each side, the opening made by the needle preventing the threads from slipping off in tying. After they are both tied as firmly as the thread will admit without breaking, the pile becomes turgid with blood, and may be pricked with a lancet or pen-knife, when it shrinks, and it is necessary to include both halves in another stronger ligature of stout but fine twine, which may be drawn as tightly as possible and tied, and then all the threads may be cut off. A poultice should at once be applied, and relieves the pain to some extent; but if the second string was tied sufficiently tight, it is not so great as might be expected. The pain which is so often complained of is in great measure due, in many cases, to the circumstance that the whole pile is not at once killed by pressure, but is only strangulated, and in a state to set up inflammation, whereas if the pressure is sufficient to cause its immediate death, the surrounding parts alone become inflamed, and those only to an extent sufficient to separate the dead pile, and without having to suffer the pressure of the ligature. It is, therefore, of the greatest importance to the ease of the patient, and to the full success of this operation, that attention should be paid to the proper tying of the second ligature. In three or four days, the piles slough off, and there is merely an ulcer which heals in the usual way.

SUB-SECT. C.—TREATMENT OF CHRONIC DISEASES OF THE HEART.

1422. IN CHRONIC DISEASES OF THE HEART OF A FUNCTIONAL CHARACTER, some little relief may be afforded by appropriate treatment. They consist (see page 144) of four kinds — viz., *palpitation*, *angina pectoris*, *fainting*, and *intermission of the regular action.*

(*a*) *Palpitation* must be treated according to the cause which produces it. Thus, in a stout and plethoric individual, low diet with hydrocyanic acid or digitalis may be necessary, while in a feeble and dyspeptic subject, ammonia or brandy will be the appropriate treatment. For this reason, it is very difficult to lay down any rules which shall be of service; but the above directions may serve as some kind of guide in the selection from the prescriptions given below. Where palpitation is evidently connected with dyspepsia, and comes on at stated times after a full meal, the remedies must be directed to the improvement of the tone of the stomach without reference to the palpitation.

(*b*) *Angina Pectoris*, as marked by the symptoms detailed at page 144, is very little under the control of medicine *as a rule*, though exceptions sometimes occur, in which certain remedies have a great power in removing the dreadful sensations which accompany it. *During the paroxysm* itself, cordials, and what are called antispasmodics, may be tried, prescriptions for which will be found below, and sometimes an anodyne combined with ammonia has been found to relieve the attack most completely. *In the intervals*, the health must be strengthened as much as possible, and every precaution should be taken to prevent excitement both of body and mind. A seton over the region of the heart has in some cases been found to put off the recurrence of the attack, but in others it has totally failed.

(*c*) *Fainting*, though sometimes connected with disease of the heart, is really a loss of the usual action in the brain, from want of blood circulating in it. It has, therefore, been included at page 457 among the different diseased conditions of the brain, and the remedies for it will be found given there.

(*d*) *An intermitting pulse*, though generally a sign of organic disease, is sometimes only caused by functional disorder; and when this is the case, attention to the congested state of the liver which has produced it will often relieve the heart of the difficulty in obtaining its proper quantity of blood, and then the beats become regular as usual.

(*e*) The *formulas* likely to relieve functional disorders of the heart are as follows:—

Take of Diluted hydrocyanic acid, min. xxiv.
Syrup of orange-peel, ℥ss.
Distilled water, ℥viiss.
Mix, and give two table-spoonfuls whenever the palpitation is urgent;

Or, take of—
Sal-volatile,
Compound tincture of lavender, ā ℥ss.
Camphor mixture, ℥v.
Mix, and give three table-spoonfuls when the palpitation comes on;

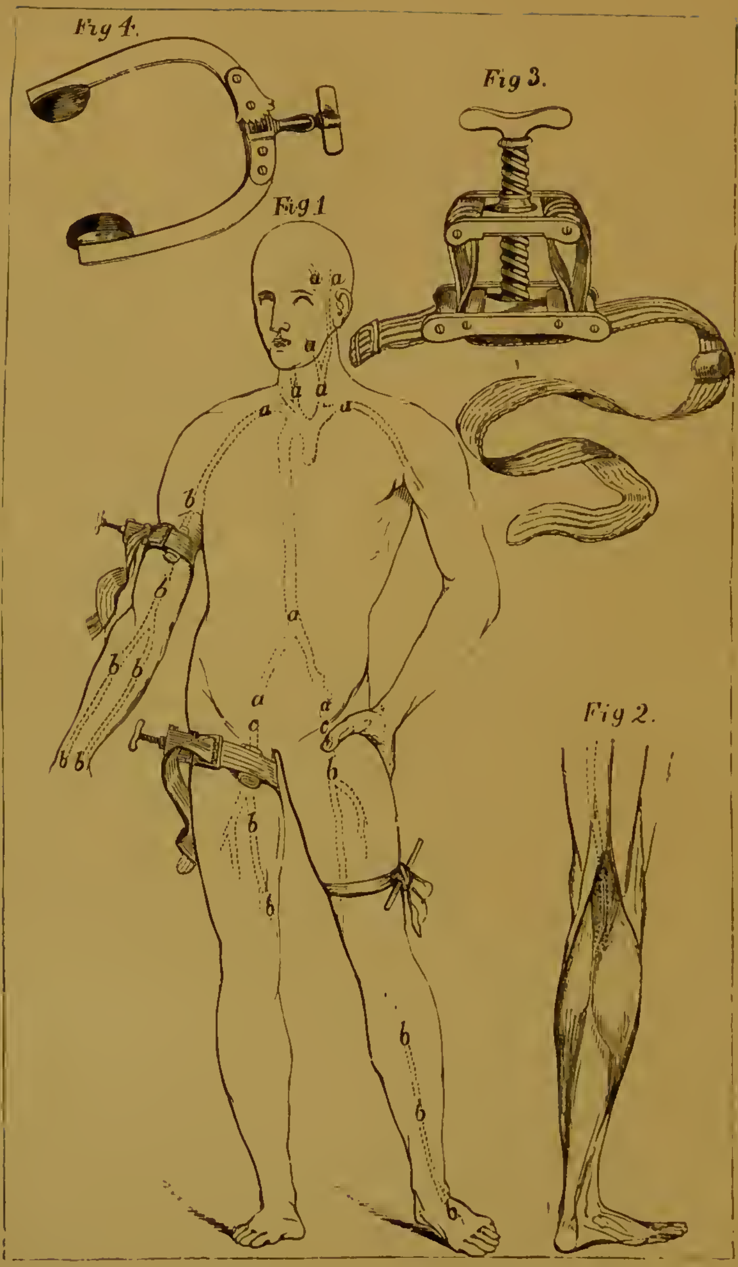
Or, take of—
Fetid spirit of ammonia, ʒj.
Tincture of henbane, min. xx.
Camphor mixture, ℥j.
Mix, and form a draught, to be given when the palpitation comes on. (*This will sometimes relieve angina pectoris, as well as hysterical palpitations.*)

Or, take of—
Compound pill of galbanum,
Compound pill of soap, ā gr. v.
Mix, and make into two pills, to be given in *angina pectoris*, and repeated every second hour, if necessary.

1423. ORGANIC DISEASE OF THE HEART is wholly beyond the reach of domestic treatment, and all that can be done is to avoid exciting its action by any violent exertion. The above remedies may, however, be tried as palliatives of its attendant evils.

SUB-SECT. D.—TREATMENT OF HEMORRHAGE.

1424. THE HEMORRHAGIC DIA-



MODES OF ARRESTING BLEEDING. P. 477.

Fig. 1. Diagram of the principal arteries, showing the places where pressure can be applied with advantage.
,, 2. The politeal space and artery.
,, 3. The common tournequet.
,, 4. The branched tournequet.

THESIS (see page 145), when it is known to exist, should lead to great care in avoiding all wounds and trifling operations, such as tooth-drawing, &c.; and if such are unavoidable, the patient should be carefully watched, and the proper remedies to be presently noticed should be applied. There is no plan known by which this tendency to hemorrhage can be removed.

1425. WHEN THERE IS BLEEDING FROM A WOUNDED VESSEL OR VESSELS to such an extent as to be injurious to the health or strength, or indeed to life itself, some measures must be taken to stop it, and these are very simple in principle though requiring a considerable amount of tact to carry them out.

(*a*) *If it occurs after drawing a tooth*, by forming a pad of lint or linen of such a size as to fill the gap made, when firmly pressed into it, the bleeding may generally be arrested, supposing the patient can be kept quiet, with the teeth firmly pressed together. Care should be taken that the pad is large enough, and it should be held in its place by a firm pressure of the fingers for some minutes before it is entrusted to the pressure of the other jaw.

(*b*) *If the bleeding is from a clean cut, and it comes out in jets*, there is an artery wounded, the size of which may be judged of by that of the stream. If it is no larger than the wire of a lady's hair-pin, by exposure to the air and the use of cold water, it will generally stop bleeding in the course of a few minutes; but if of a size above this, pressure must be employed on the wound itself, or just above it, or the wounded vessel must be tied by a fine piece of silk, the mode of doing which is described at page 395. *When the divided vessel* is large enough to throw out a stream of the size of a goose-quill, not a moment must be lost in making pressure, either on the wound itself, or on the course of the artery above it. There are certain situations in the limbs and body where this pressure may be made with advantage, always taking care to select the one next *above* the wound which is bleeding. These situations are marked in the *annexed diagram*, which on one side shows the method to be adopted in domestic surgery, when there is no instrument called a tourniquet at hand, and on the other, gives that instrument in the two forms which are now usually adopted. In some places the pressure can only be made with some solid substance held in the hand, because the part is incapable of being surrounded, or, if capable, the bandage would be otherwise injurious, as in the neck, where it would produce strangulation. These are all marked with the letter (*a*), indicating that an instrument is of no use, and that the hand alone must be trusted to, armed with a firm substance, such as a key with its handle wrapped in linen. Those marked (*b*) may be compressed in any way—that is, either by the common handkerchief or bandage over a pad, placed upon the proper spot and tightened by twisting a stick, as shown in the diagram; while the spots marked (*c*) can be commanded by the branched tourniquet, which is now extensively employed, as well as by the hand and key, but not by a circular bandage or by the common tourniquet. In every case care should be taken to place the pad *across* the course of the artery, so as to be sure of its not slipping on one side, and then the circular tape or bandage being drawn as tight as possible, it is tied or buckled; after which the stick is twisted, or the screw turned, as the case may be. In applying the common tourniquet, care must be taken to unscrew it before drawing the tape tight, as if it is put on with the screw at its highest point, or nearly so, it will be wholly useless when wanted, and the instrument must be taken off and reapplied. The branched tourniquet is much more easy of application, and may be put on any limb, whether large or small, by any one possessing the most ordinary amount of tact. Here, also, the pad should be made to cross the artery, and then nothing else is required but to turn the screw sufficiently to command the bleeding. These instruments must not be left on at full pressure longer than is absolutely necessary, or they will often cause extensive sloughing, not only of the part where they are applied, but of the limb below. They are only to be used until further means can be employed for arresting the bleeding. But, supposing that in the wound of a large artery, after thus stopping its flow for a time, no surgeon can be obtained to tie the vessel—what is to be done? The fact is, that the operation is wholly impracticable without a knowledge of the anatomy of the part; and, therefore, all that can be done is to keep up a slight degree of pressure upon the course of the artery with the tourniquet or bandage, and to trust to the powers of nature in healing the wound in the artery, under the pressure kept up in the wound itself, assisted by the modified amount of it on the course of the artery. This must not be to so great an extent as to keep the limb turgid with blood, but short of this it may be carried out for a long time. The dressings to the wound are better left on for at least ten days, keeping them as clean as possible by the use of cold water, but not venturing to change them for fear of a return of the bleeding. By carrying out these instructions, it is *possible*, even in the wound of a large artery, to save life by *domestic means*, but the chance is certainly not a very good one.

1426. IN TREATING HEMORRHAGE FROM DISEASE, the remedies applied will vary with its nature—that is, whether consisting of *active* or *passive* hemorrhage, or that flowing from the *nose*, or from the *lungs*, or the *stomach*, or the *bowels*, or the *bladder*, or *kidneys* (see page 145). Some of these have been already considered, as bleeding from the *nose* (at page 334), and hemorrhage from the *bowels in fever* (see page 358).

(a) In active hemorrhage, when there is excessive action of the heart and arteries, it is sometimes necessary to adopt all the measures which are required for inflammation, or there will be no possibility of stopping the flow. Thus, bleeding from the arm, tartar-emetic to the extent of vomiting or nausea, and even calomel in full doses, may be necessary (see page 365); but these cases are not very common, and the extent of the *increased* action may generally be subdued by the use of digitalis, after which styptics will be able to control the bleeding. Still there are some violently active hemorrhages in which nothing short of a full bleeding will have the desired effect.

(b) In passive hemorrhage, on the contrary, the attention must be directed, in the first place, to get rid of the congestion, and afterwards to close the open mouths of the bleeding vessels, which often part with their blood by a kind of oozing, and, in that case, cease to give it out as soon as the congestion is removed. (See *Treatment of Congestion* at page 363).

(c) *When a vessel has given way, in consequence of ulceration of its coats*, the first thing to be done is to stop the flow of blood, by lowering the circulation in the way least injurious to the health, and then paying attention to the healing of the ulcer. This kind of bleeding generally occurs in the lungs, and will be presently considered as such (see *Hemoptysis*).

1427. HEMATEMESIS OR VOMITING OF BLOOD (see page 146), when dependent upon congestion of the liver and stomach, as is frequently the case, must be treated by such remedies as will get rid of that condition. *Cold* liquids of the most bland kind should be the only aliment allowed; and if the bleeding is excessive in quantity, ice may be constantly swallowed in small portions at a time, while a bladder containing pounded ice may be applied to the stomach. Calomel combined with opium will generally be required to relieve the congestion in the dose of half a grain of each every four hours, followed by an aperient such as the annexed:—

Take of Sulphate of magnesia, ℥ss.
Diluted sulphuric acid, ʒss.
Tincture of henbane, min. xxv.
Mint water, ℥j.

Mix, and give twelve hours after the first pill. If the bleeding is evidently connected with organic disease, one or other of the following mixtures may be tried:—

Take of Diluted sulphuric acid, ʒij.
Tincture of opium, ʒj.
Infusion of roses, ℥viiss.

Mix, and give two table-spoonfuls three times a day;

Or, take of—
Acetate of lead, gr. xvj.
Distilled vinegar, ʒij.
Tincture of matico, ʒij.
Tincture of opium, ʒj.
Water, ℥viiss.

Mix, and give two table-spoonfuls three times a day. When the bleeding appears to have followed upon the suppression of any habitual discharge from the bowels or uterus, the application of a few leeches to the *perinæum*, allowing the bites to bleed freely in a warm hip-bath, will often relieve the hemorrhage from the stomach. After this has ceased, it will be prudent at all times to brace its lining membrane by the use of the mineral acids, or the trisnitrate of bismuth, or some other stomachic. (See *Dyspepsia*).

1428. Hemoptysis, or Expectoration of Blood (page 146), generally occurs in the last stages of tubercular consumption, and must then be treated as a part of that disease (see page 470). Sometimes, however, it is merely a general oozing of blood from the lining of the bronchial tubes without any absolute ulceration, so as to cause the vessel to be "broken" as it is usually called, and here the danger is comparatively trifling. But the ordinary observer of disease will have great difficulty in detecting the exact nature of the attack, and can scarcely be expected to be able to distinguish between the two forms of this disease. It will, therefore, be necessary to give such directions as may suffice for either of these conditions. *In the first place*, perfect rest of body and mind must be inculcated and carried out, the voice must never be raised above a whisper, all food must be taken cold, and the patient must be kept in bed, with the skin comfortably warm, *and the air of the room as cool as possible. The next indication* is to control the action of the heart, without which it will be hopeless to attempt any means by which the bleeding shall be checked; and if the pulse is very strong, and the disease is evidently not connected with the last stage of phthisis, blood must be taken from the arm. Generally, however, a few grain doses of ipecacuanha will nauseate sufficiently to effect the purpose; and they may be given with the acetate of lead, which will thus have time to be absorbed while the nausea is controlling the circulation. The plan will, therefore, be to commence by giving the following pills if the heart is acting very violently, or, if the contrary, omitting the two first ingredients:—

Take of Powdered ipecacuanha, gr. vj.
Powdered digitalis, gr. ss.
Acetate of lead, gr. xij.
Powdered opium, gr. iv.

Mix, with confection enough to make six pills, one to be given every three hours. When the circulation is reduced to such an extent as to warrant our dependence upon styptics alone, the pills may be stopped, and the following mixture given alone:—

Take of Acetate of lead, gr. xvj.
Distilled vinegar, ʒiss.
Tincture of matico, ʒij.
,, digitalis, ʒiss.
,, opium, ʒj.
Camphor mixture, ℥vij.

Mix, and give two table-spoonfuls every four or six hours. (*These medicines must be carefully watched, as the lead may possibly produce colic, or the digitalis lower the heart to much. Indeed, they should never be given by any one but the physician, except in extreme cases where assistance cannot be readily procured.*)

1429. The Treatment of Bleeding from the Intestines, when it occurs during fever, is included under that head at pago 358. If it should come on together with diarrhœa or dysentery, the acid mixture given at page 377 may be tried; and if this fails, the mixture of lead, ipecacuanha, and opium, ordered at par. 1428 for hemoptysis, may bo used with advantage. Very often it only arises from internal piles, which may be known by tho florid colour of the blood (see par. 429), and then the treatment prescribed for that disease is to be carried out according to the directions given at page 474.

1430. THE TREATMENT OF HEMORRHAGE FROM THE KIDNEYS AND BLADDER is included among the effects of inflammation of those organs at page 449.

1431. THE TREATMENT OF MENORRHAGIA and of vicarious bleedings in the female sex (pars. 431, 432) will be included under chap. 23 of this Part, on the *Treatment of the Diseases of Women.*

CHAP. XVIII.

TREATMENT OF CHRONIC DISEASES SUPPOSED TO BE CONNECTED WITH THE NERVOUS SYSTEM.

SECT. 1.—TREATMENT OF EPILEPSY.

1432. EPILEPSY (page 147), like all other diseases coming on in paroxysms, is to be treated differently during the paroxysms or fits, and in the intervals between them.

(*a*) *During the paroxysm* the patient should, if possible, be placed on a bed or sofa where no injury can be done to the head in the violent struggles which form part of the disease. The neck-cloth should be loosened if a male, or the stays, in the female sex; and then in the majority of instances it is only necessary to have a little patience and in a few minutes the fit goes off. Sometimes, however, there is a long continuance of it, and then (and indeed in all cases in my opinion) it is the best plan to wet the corner of a coarse towel or cloth in cold water, and slap the ears and side of the neck forcibly with it. This would of course occasion great pain if the sensibility remained at the time; but as soon as it is felt the fit is disappearing, and it may be discontinued, though it is better to persevere a little longer rather than to allow it to go on unchecked. I have employed this method in many scores of cases for the last thirty years, and I never had any difficulty but once in cutting short the fit with it alone; and in that case there was evident danger of inflammation, and I thought it more prudent to use leeches. I believe that it is the mechanical shock and stimulus to the nerves which is of so much service, and hence it is far surer and quicker in its operation, than the most rapid blister. It is also a most simple remedy, and one which is always at hand, so that on every account it is exactly what is required. Certainly to the relatives it may appear unfeeling to be slapping a poor afflicted patient at a time when there is apparently great danger; but they must remember, that by this treatment the amount is reduced to a very trifling degree, and the length of the fit is diminished at least one-half, the hold on the constitution being also materially lessened; so that, after all, it is by far the most humane, as well as the most successful, method of relief. When once the fit is thoroughly gone, a dose of aperient medicine should generally be administered, and then the patient may be allowed to indulge the propensity to sleep, which becomes developed almost invariably at that time.

(*b*) *During the intervals of the fits* any irritant cause should be removed which may be discovered and which may be supposed to produce or develop the fit. Thus, if there are worms, or if the patient is costive, or the reverse, these several conditions should be attended to (see *Worms*, *Constipation*, *Diarrhœa*, *&c.*) But if, as is usually the case, no tangible cause can be discovered, the best plan, in my opinion, is to give an occasional mercurial aperient sufficient to clear out the bowels and then to have recourse to the only known specific for this disease, which is bromide of potassium, in doses of 3 to 5 grains twice a day. This medicine is so powerful that its action ought, if possible, to be watched by a medical man; and it is only in situations where his services cannot be obtained that it is justifiable to use it without his supervision. It requires a long continuance to cure epilepsy; and when the excitement of the nervous system produced by the bromide is very great, it should be discontinued for a few days and then resumed. I have known more than one case in which epilepsy has been by its means cured in the adult, but it is far more certain in its results when given to the child. If the patient is plethoric, it will be necessary to reduce the usual *diet*, and even to take blood occasionally by leeches or cupping; but it is far better to cut off the supplies than to remove the blood after it is formed. Supposing, on the other hand, that epilepsy occurs in a feeble subject, quinine, or bark itself, together with port wine, and in some cases steel, may be advisable; but with these I should always combine the bromide of potassium.

(*c*) *When epilepsy occurs in connection with any disorder of the uterine functions*, it is important to take every proper measure to restore them to a natural condition, when it may be hoped that the epilepsy will cease; but, if it should not, reliance may still be placed on the mistletoe, as above ordered.

(*d*) *No one afflicted with epilepsy should be trusted alone* in any situation where the occurrence of the fit would be attended with dangerous consequences.

SECT. 2.—TREATMENT OF HYSTERIA.

1433. HYSTERIA (page 148), like epilepsy, must be considered with reference to its treatment under the two aspects of the *paroxysms* and the *intervals* between them.

(*a*) *In a fit of hysterics* (par. 437), it is in most cases of little importance whether anything is done or not beyond the loosening of all tight lacings, &c., which are decidedly prejudicial, and most distressing to the patient. As a general rule, it is the tendency to these attacks which is to be removed by appropriate treatment, and not the attack itself, which, like a thunderstorm, often gives great relief for a time to the overcharged nerves. Sometimes, however, the fit is of such a prolonged or severe nature as to require interference, and in that case the dashing of cold water in the face, or the use of the towel as recommended for epilepsy at page 480, will be found to be most effectual. Indeed, there is nothing which so soon gets rid of an attack as this latter method, which is far superior to the extensive use of cold water thrown over the patient, as is so often done, because it does not give "cold" as the water does when it saturates the clothing at a time and place where it often cannot be changed. When the paroxysm is complicated with spasm of the larynx (see page 149), the danger appears to an ordinary observer to be imminent; but it is not really so, and the use of the towel, or the application of a mustard-plaster to the upper part of the chest, will generally remove the spasm. Ammonia will often give relief, and a tea-spoonful of sal-volatile mixed with water and swallowed, or the common smelling-salts held to the nose, are the popular remedies, and very useful ones too. If these fail, the following draught may be tried:—

Take of Sesquicarbonate of ammonia, gr. v.
Sulphuric ether,
Compound tincture of lavendar, ā ʒss.
Camphor mixture, ℥j.
Mix.

(*b*) *In treating the hysterical diathesis* (see par. 436), every means must be employed by which the body can be restored to health, and the nervous system braced. Cold bathing, and especially in the sea, is a most excellent remedy; but previously to its employment, it should be ascertained that the several secretions of the liver, bowels, womb, &c., are in good order, and if not, proper remedies should be at once used for them. Change of air, and especially of scene, will often work wonders; and if the mind is constantly worked upon by any excitement, whether real or imaginary, this should, if possible, be removed, or at all events reduced to its lowest point. Exercise of an active kind, and particularly on horseback, should be enjoined, and enforced to such an extent as to produce considerable fatigue, but not of that character as to prevent, rather than encourage, sound sleep. In most cases tonics are required, but sometimes the opposite treatment must be adopted by means of low diet and lowering medicines. Very frequently, but by no means invariably, some irritation of the uterus is the cause, and then that organ must be quieted by appropriate treatment; and if its proper secretions are not in regular order, they must be induced according to the principles laid down under the head of *Amenorrhœa* in the 23rd chap. of this Book.

(*c*) *Hysterical simulations of local inflammations* (see par. 439) are to be treated on the general principles described at (*b*), without any reference to the local affection which is only rendered worse by any attention being paid to it. Thus blisters and other counter-irritants are found to be more than useless, and should by all means be avoided.

SECT. 3.—TREATMENT OF CATALEPSY AND TRANCE.

1434. All that can be done in cases of catalepsy is to improve the general health, without reference to the paroxysm; and as to *trance*, it occurs so rarely, and we know so little of its nature, that it is useless to refer to its treatment in any way.

SECT. 4.—TREATMENT OF CHOREA.

1435. CHOREA being purely a disease of childhood, its treatment has been included among the diseases of that period at page 329.

SECT. 5.—THE TREATMENT OF MANIA.

1436. WHEN AN ATTACK OF MANIA (see page 151) makes its appearance at a distance from all medical aid, it becomes a very difficult task for the friends or lookers-on to know how to act in such a way as shall be humane to the individual, and yet safe for themselves. In this country the course is clear enough, and is, in fact, compulsory by law whenever any bodily restraint is to be practised; and as this is imperative in all well marked cases, the superintendence of a properly qualified medical man must always be obtained, and he will then direct what is proper to be done. But in the case above-mentioned, it is well to proceed as follows:—1st, Take measures to secure the safety of the individual and his attendants, either by constant watching carried out by sufficiently strong nurses, or else by the application of a straight-waistcoat, which is nothing more than a strong canvas shirt, with long sleeves including within them the hands, and tied to the side of the bed, also fastened securely round the neck and waist; when this is put on, the side-fastenings cannot be loosened, because the hands are muffled by the shirt-sleeve, and are kept apart by the fixture of each to its own side of the bed; 2nd, keep the head cool by the application of cloths dipped in cold water, or a bladder of ice if at hand; 3rd, give a smart dose of mercurial aperient, which may be repeated every other day; 4th, in the early stage, tartar-emetic carried to the extent of nausea will often be of service, but is only adapted for strong and robust individuals. If the mania is at all allied to hysteria, it may be treated like that disease (see par. 1433); or on the other hand, if there is much tendency to *hypochondriasis*, the stomach may be treated as for dyspepsia; while the form known as *melancholia* will sometimes yield to medicines which act specially upon the liver (see next chap.) Beyond these remarks, little useful information can be given on this difficult subject. Much will always depend on the moral treatment of the insane; but in such circumstances as those we are now considering, there is little opportunity for its enforcement. Harsh conduct should, however, always be avoided; but excessive kindness, especially from friends and relations, is almost always thrown away; and it is very remarkable that those who are most loved and admired by the insane in the intervals of their malady are sure to be the most abused and disliked by them during the attack. For this reason among many others, the friends are peculiarly unfitted for the management of their maniacal relations, and hence the removal of the latter to an asylum is often beneficial to them, from the enforced absence of their over-kind and over-anxious relatives; independently of the superior nature of the treatment.

CHAP. XIX.

TREATMENT OF CHRONIC DISORDERS OF THE DIGESTIVE ORGANS.

SECT. 1.—TREATMENT OF DYSPEPSIA.

1437. THE MANAGEMENT OF THE DISEASED OR DISORDERED CONDITION OF THE STOMACH, which we are now to consider, must be divided into two portions—1st, that embracing all the particulars which it is necessary to attend to in every case of indigestion; and, 2nd, the application of particular remedies suited to each variation of the disease.

(*a*) *The general treatment of dyspepsia or indigestion* must be framed on a knowledge of the deviations which are found to occur from the natural process (see page 154). Thus, each stage of digestion will occupy our attention, and we must see—1st, that mastication is properly performed; 2nd, that no more food is passed into the stomach than will be dissolved there by the gastric fluid; 3rd, that there is a proper supply of bile; and, 4th, that the bowels carry off the products of digestion with a proper degree of rapidity, neither being too much confined to make room for more food, nor so relaxed as to carry off the chyle before it is absorbed by the *lacteals*. In addition to these points, we must also provide a due amount of exercise, proportioned to the quantity of food taken and to the muscular strength of the patient, so that the system shall not be over-loaded with nourishing material, but that it may be wasted or consumed as fast as it is provided. All this is, however, alluded to at length at pages 153, 154, and 155. With regard to the *kind of diet* best suited to a dyspeptic stomach, many rules have been laid down for the guidance of the young members of the medical profession, and these have been retailed to the public with great minuteness. But if patients will use their own experience, they will derive far more benefit than from any set rules, because there are no two stomachs alike in their powers of digesting food, or in their list of agreeables and disagreeables. Some otherwise weak stomachs are always the better for lobster-salad, or for salmon-and-cucumber, while others are invariably upset by the slightest morsel of these tempting dishes. Nevertheless, it may be asserted, *as a rule*, that neither are so digestible as plain roast or boiled meats, poultry, and game (see page 17).

(*b*) *Want of tone in the stomach* (see par. 453) is to be relieved by those medicines called stomachics; but the best of all is exercise of the body, with cheerful amusement of the mind, and taken in a fresh air, which should be the reverse of that to which the individual has lately been accustomed. In other words, "change of air" is desirable, either from the sea-coast to a dry inland situation, or *vice versâ*, or from a low and moist locality to a high and dry one, free from luxuriant vegetation, and exposed to all the winds of heaven. The flatulence which often occurs is relieved as soon as the tone of the stomach is restored, and does not require any special remedies for it. The following *formulas* are useful:—

Take of Liquor of potass, ʒj.
Infusion of rhubarb, ℥j.
Tincture of cardamoms, ℥ss.
Infusion of gentian or chirayta, ℥viss.

Mix, and give two table-spoonfuls three times a day;

Or, take of—
Compound tincture of bark, ʒj.
Decoction of cinchona, ℥xj.

Mix, and give three table-spoonfuls three times a day;

Or, take of—
Extract of chamomile, ʒj.
Powdered rhubarb, gr. xij.
Oil of caraway, min. iij.

Mix, and divide into sixteen pills, one of which is to be taken three times a day;

Or, take of—
Powdered capsicum, gr. vj.
,, rhubarb, gr. xij.
Extract of dandelion, gr. xlviij.

Mix, and divide into twelve pills, one to be taken three times a day.

(*c*) *Congestive dyspepsia* (see par. 454) will usually be relieved by the hydrocyanic acid, or creasote, or sometimes by the mineral acids in small doses. A blister to the stomach will also often give relief, or the stimulating embrocation under spongio-piline ordered at page 349. The *formulas* are as follows:—

Take of Diluted hydrocyanic acid, min. xxiv.
Syrup of orange peel, ℥ss.
Distilled water, ℥viiss.

Mix, and give two table-spoonfuls three times a day;

Or, take of—
Diluted sulphuric acid, ʒj.
Infusion of roses, ℥viiss.
Syrup of orange peel, ʒiij.

Mix, and give two table-spoonfuls three times a day;

Or, take of—
Creasote, min. xij.
Extract of henbane, gr. xxiv.

Mix, and divide into twelve pills, one of which is to be taken three times a day.

(*d*) *Irritable or neuralgic dyspepsia*, sometimes called *gastralgia* (see par. 455), is greatly relieved by the employment of the trisnitrate of bismuth, together with an anodyne, which should be in as mild a form and dose as will suffice to relieve the pain. The following pills will usually afford relief:—

Take of Trisnitrate of bismuth, ʒj.
Acetate of morphia, gr. j to gr. ij.
Extract of dandelion, ʒj.

Mix, and divide into twenty-four pills, two of which are to be taken three times a day. If there is much flatulence, the following mixture may be taken with the pills:—

Take of Sesquicarbonate of ammonia, ʒss.
Bicarbonate of soda, ʒss.
Tincture of gentian, ℥ss.
Camphor mixture, ℥vss.

Mix, and give two table-spoonfuls, when the flatulence is urgent, with the dose of the above pills.

(*e*) *Water-brash* (see par. 456) is almost always relieved by the trisnitrate of bismuth in full doses, and if there is no pain accompanying it, there will not be any occasion for the anodyne as ordered in the last paragraph. But it is also necessary to give some stomachic after the water ceases to flow, and the mineral acids will generally serve the purpose remarkably well. It is desirable to see that the liver is acting properly before commencing the bismuth, and if not, the remedies which will be alluded to in the next section must be first employed, and then it will be time to attend to the water-brash by means of the following :—

Take of Trisnitrate of bismuth, ʒj.
Powdered ginger, gr. xij.

Mix, and divide into twelve powders, one of which is to be given three times a day. When the stomach is relieved of this secretion of water, begin the following :—

Take of Diluted hydrochloric acid,
,, nitric acid, ā ʒss to ʒj.
Infusion of cascarilla, ℥viiss.
Tincture of hop, ʒiij.

Mix, and give two table-spoonfuls three times a day.

Sect. 2.—Treatment of Chronic Disorders of the Liver and Bowels.

1438. Torpidity of the Liver (see par. 457) is to be relieved *for the time* by such doses of calomel, or blue pill, or mercury-with-chalk, as are suited to the extent of the mischief, united with mild aperients and stomachics, which aid the action of the liver by improving the tone of the intestine into which it pours its bile. But it is never desirable to continue these mercurial stimulants (or *cholagogues* as they are called), because they act prejudicially on the nervous system, and produce neuralgia, as well as weaken the tone of the stomach and bowels. Podophyllin, though not so powerful as mercury, is more active than any other cholagogue, but, like it, the effect on the nervous system is prejudicial. Agitating the liver mechanically, either by horse exercise or by violent jumping or running, is undoubtedly the only means of exciting it without any injury whatever; and when these remedies are objected to from any cause, striking the right side with a boxing-glove on the hand severely is an excellent substitute, almost equal to horse exercise. It should be continued for a time, varying from ten to twenty minutes every night, in the recumbent position, when the abdominal muscles are relaxed. Any one of these plans will succeed if persevered in; but unfortunately it seldom is, and therefore some other must be substituted for it in many cases, and the best is as follows :—First start the liver as before, then take care to avoid excess in quantity or quality of food (as is always done by sensible people who suffer from them), and as a medicine take the following pill with each *full* meal during the day, or if the appetite is not very good and the bowels are not very obstinate, with one only :—

Take of Powdered ipecacuanha, gr. ss.
,, rhubarb, gr. iij to vj.
,, ginger, gr. ss.

Mix, and make into a pill. The quantity of rhubarb is to be increased or diminished according to the effect upon the bowels (see pages 346 and 347).

1439. When Excess of Bile occurs (see page 156), the bowels are irritated by it to such a degree as to produce diarrhœa or vomiting. Here the defect generally consists in the use of food which is too rich, such as soups, made-dishes of various kinds, and sauces; and the remedy is simple enough, being merely an avoidance of them, and a limitation to the most simple kinds of diet, and to stale bread or dry toast, as the best kind of adjunct to roast or broiled meats. Very often it will be found necessary to soothe the mucous membrane with some mild and emollient mixture, such as that annexed :—

Take of Aromatic confection, ʒj.
Chalk mixture, ℥viiss.
Compound tincture of camphor, ʒiij.

Mix, and give two table-spoonfuls when required. If the vomiting is excessive, a litle soda water, with one or two tea-spoonfuls of brandy in it, will be found to be the best means of relieving that condition; or the ordinary effervescing mixture may be given (see page 342).

1440. Want of Tone in the Bowels (par. 156), is to be treated on the same principles, and by the same remedies, as are ordered for the corresponding condition of the stomach (see page 483).

1441. HABITUAL CONSTIPATION (par. 157) may be treated according to the plan laid down at pages 346 and 347. To these medicinal remedies may also be added the use of the *enema-syringe*, which will give great relief when the defect is confined to the *colon* and *rectum* alone; but when there is a want of action in the small intestines also, the stimulation of the large bowels by injections is wholly ineffectual. For this reason it is that this remedy has been so much vaunted by one party and decried by the other, for in one species of constipation it is all-sufficient, while in the other it fails altogether. Nevertheless, in all cases it may be tried in preference to drugs even of the most simple kind, and if it succeeds it may be regularly employed; but if the fluid thrown up returns without a full relief of the bowels, it may at once be conjectured that the defect is beyond its reach. Warm water, in which a liberal allowance of *yellow* soap has been dissolved, is as good as anything for the purpose; *or*, a table-spoonful of common salt may be employed, dissolved in the water; *or*, in those who have long used the warm water, and in whom the bowels have become so accustomed to its presence that they fail to return it, moderately cold water may be used instead; but it should never in the winter season be thrown up when of the temperature of the surrounding air; indeed, lower than 50° or 60° F. will seldom be safe. The *quantity* used must be such as to cause the bowels to act, whatever it may be, and in some cases two or three quarts will be required, while in others from half a pint to a pint will be quite enough.

1442. HABITUAL LOOSENESS of the bowels should be controlled rather by food than by medicine, if it is possible to manage it. The experience of the individual is generally the best guide and if he or she will take care to avoid those articles which produce a looseness in the motions, they will generally succeed in avoiding all necessity for drugs. If, however, they will persist in taking improper food, the remedies for diarrhœa at page 376 must be had recourse to in order to afford relief.

CHAP. XX.

THE REMOVAL OF THE PARASITIC ANIMALS INFESTING MAN.

SECT. 1.—WORMS, HYDATIDS, &C.

1443. THE INTESTINAL WORMS peculiar to man have been treated of at page 330, as almost peculiar to the age of childhood. Tape-worm, however, is often met with in the adult, and when this is the case, the largest dose of the remedies which are ordered at page 331 must be administered according to the directions there given.

1444. THE GUINEA WORM is the only one of those found in the *kidney*, *bladder*, *bronchia*, *skin*, and *muscles* of the human subject (see pages 158-9) which is capable of relief even if they are discovered during life. This worm, however, is never met with in this country, being confined to tropical climates; the *treatment* for its removal consists in the cautious and gradual extraction of the whole animal, without breaking it across, which would be followed by violent local inflammation and constitutional disturbance. For this reason it is of no use to attempt its extraction until it protrudes its head of its own accord, which in course of time it is sure to do; then cautiously laying hold of as much as can safely be drawn out, without breaking through its body, it is wound round a smooth piece of stick, and this is retained in its position close up to the opening through which it has escaped by a piece of adhesive plaster. In twelve hours this may be carefully raised and the worm again cautiously pulled out of its bed and still further wound upon the stick; and by repeating this process every twelve hours, in the course of ten days or a fortnight the whole worm is drawn out without injury to its substance, or inflaming the bed in which it was coiled up.

SECT. 2.—THE MEANS OF DESTROYING THE PARASITES WHICH INFEST THE SURFACE OF THE BODY, AND OF RELIEVING THEIR BITES.

1445. THE LICE which infest the human head do not bury themselves beneath the surface of the skin, and therefore require the protection of the hair as a *habitat*. The insects themselves are readily destroyed by the use of the ammonio-chloride of mercury (*white precipitate*), which may be powdered into the roots of the hair when it is cut short without danger of absorption, so long as the skin and hair *are not wetted*. It will not, however, destroy the vitality of the eggs (commonly called *nits*), which adhere to the hairs in the form of little white specks, and which should be carefully searched for and removed. Indeed, the mechanical destruction, after the hair is cut short, is the best method in all cases—a sharp pair of eyes and a tooth-comb soon clearing a head of every living inhabitant; but when the task is objected to, the use of the white precipitate is quite sufficient for the purpose.

1446. BODY LICE burrow into the skin, but are chiefly met with in those parts of the body which are covered with hair. They may be destroyed with the greatest ease by rubbing into those parts the ammonio-chloride of mercury, as above ordered. This very soon relieves the intense itching which they occasion.

1447. THE CURE OF ITCH, which is produced by an *acarus*, is included under *Diseases of the Skin*.

1448. THE DESTRUCTION OF BUGS AND FLEAS belongs rather to the department of *domestic economy* than to that of medicine. Their bites may be allayed by the same measures as are recommended at page 400 for the *Stings of Insects*.

CHAP. XXI.

TREATMENT OF MALIGNANT DISEASES.

1449. WHEN MALIGNANT DISEASES, whether of a scirrhous or medullary nature, attack the internal parts of the body, all that can be done is to support the strength by the most nourishing diet, and to postpone the employment of anodynes to soothe the excruciating pain, until it can no longer be borne without them. There always comes a time when the most powerful of them cease to give relief; and with this knowledge they should be husbanded, because it is comparatively more easy to bear pain before the body is worn down by disease than at a time when it is almost utterly exhausted. Hence, it is the practice to try hemlock or henbane as long as they will afford relief, and not to have recourse to opium or its salts until the necessity for them becomes imperative.

1450. BUT IN EXTERNAL CANCER there is another question to be considered—namely, the propriety of its removal by the knife, or by the use of caustics. It is found that the duration of life, in a large number of cases, is about fourteen months from the time when the disease becomes clear, and no operation seems to postpone the fatal period in the long run; for although in some cases it eradicates the disease for a great number of years, yet in others it accelerates the event, and thus, *on the average*, no effect is produced. But though the chance and duration of life are not affected by the removal of cancer, yet the degree of comfort and freedom from pain are most materially increased by removal; so that in the present day, when the operation is a painless one by favour of chloroform, few will hesitate to accept the boon which it offers. In comparing the knife and the caustic, there appears to be no advantage in favour of the latter, although many pretend that it is far more hopeful with regard to its effect upon the return of the disease; but such statistical data as are worthy of credit give the lie to the assertion, and the knife must at present claim the credit of being the most quick, and by far the most humane, method of removal. But in order to be worthy of being performed at all, the operation should be done very early, and before the lymphatic glands above the cancer have had time to be contaminated, which they show by their enlargement, and the pain which is felt in them. If, therefore, a patient is unfortunately afflicted with cancer in any external part of the body, my advice is to have it removed as soon as possible by *the knife* under the use of chloroform, and if at a distance from a surgeon, to lose no time in travelling to him. We none of us can predict what discovery may be made by which this disease may at some future day be placed within the control of medicine; but at present we have no reason to believe that any remedy has been discovered which is capable of accomplishing more than the mechanical removal or chemical destruction of the local disease.

CHAP. XXII.

TREATMENT OF THE DISEASES OF THE EYE, EAR, NOSE, MOUTH, &c.

Sect. 1.—Diseases of the Eye.

1451. The proper Treatment of the Stye is given at page 332.

1452. Redness of the Edge of the Lids, caused by inflammation of the small ducts opening there (see page 162), is to be relieved by the use of the ointment of nitric oxide of mercury, a little of which is to be rubbed into the roots of the eye-lashes, with the eyes gently closed, every night.

1453. When the Inside of the Lids is Rough and Granular (par. 492), a smooth piece of the sulphate of copper may be gently rubbed on the inside of the lids, taking care to keep them open until the solution caused by the tears is washed off from the eye itself by using a syringe, with tepid water. The application may be repeated as soon as the increased redness of the white of the eye has gone; but the disease is a long time in being removed.

1454. When the Hairs Grow Inwards and irritate the eye, an operation may be done by the skilful surgeon for their replacement in a proper position. In his absence a little collodion may be brushed over the lid which is faulty and in drying it will contract the skin, and thus for a few hours replace the hairs. It must, however, be repeated every day, or even twice a day; but the patient can easily manage it without any assistance.

1455. Entropion (par. 494) may be cured by a surgical operation; or it may be relieved by the same means as are described for the simple turning in of the hair in the last par. But Extropion is only capable of relief by the knife of a practised operator.

1456. Confirmed Ptosis, or the Dropping of the Upper Lid (par. 495), is a symptom of organic disease, which, however, may only be of a trivial nature, or it may be very extensive. In any case it is beyond the limits of domestic treatment.

1457. Encysted Tumours and Nœvi, when occurring in the eyelids, must not be meddled with by any one but the surgeon. When small abscesses make their appearance in small-pox or erysipelas, and there is no doubt of their nature, an opening may be made with a common lancet without danger to the eye itself.

1458. In diseased conditions of the apparatus for the conveyance of the tears to the nose, much may be done by the surgeon to restore the channel which is obstructed (see par. 497); but no one else can with safety attempt the operation.

1459. Common Acute Ophthalmia (par. 498) will often disappear after an active mercurial aperient, assisted by warm bathing of the eyes, or sometimes by the employment of a cold lotion, made as follows:—

Take of Acetate of lead, gr. xvj.
Sulphate of zinc, gr. viij.
Rose water, ℥viij.

Mix, and apply constantly to the eye by wearing a light bandage round the head, to which is attached a single piece of linen hanging down over the eye. If these plans do not succeed, leeches may be applied; but in most cases, one or other of the annexed drops will succeed in arresting the inflammation. Still there is some little risk in their employment, if there is also internal inflammation; and no one should think of having recourse to their use, if it is possible to obtain good surgical advice.

Take of Nitrate of silver, gr. ij to iv.
Distilled water, ℥j.

Mix, and use as drops for the eye.

Or, take Wine of opium, and use in the same way.

1460. Chronic Ophthalmia (par. 499) will generally be relieved by one or other of the above drops, or by green tea made as for ordinary drinking, with the addition of one-sixth of its bulk of brandy. Sometimes, in spite of all these remedies, the veins of the lids are seen to be swollen on the outside, and the inflammation of the surface of the eye is not subdued. Here the safest plan for the domestic surgeon to adopt when professional aid is out of the question, consists in the blistering of the whole outer surface of the eyelids, by the application of the nitrate of silver in substance. It is a painful remedy, but a very safe one if used with any common amount of skill, and gives great relief by the discharge which it produces, and which is accompanied by such a swelling of the lids as completely prevents them from being opened, and for a few days causes total blindness. The method of use consists in closing the eyes, then damping the lids with a sponge, the stick of caustic is gently and rapidly drawn over the surface by successive strokes, touching each part once only, and the whole is suffered to dry without opening the lids. In a few hours the swelling comes on, and then the surface oozes and discharges a large quantity of serum, which goes on for two or three days, after which the skin heals without any blemish, and on recovering the power of opening the eyes, the inflammation is found to be greatly reduced, or often almost gone. This plan is included here for the benefit of those sufferers in distant colonies who are often rendered incapable of doing any kind of work by this disease, and who are willing to try any remedy in their power which is likely to be of service, while this is certainly a most efficient one.

1461. The Treatment of Purulent Ophthalmia in the new-born child is included under the chapter on the *Diseases of Infants* at page 279.

1462. Strumous Ophthalmia (par.

501) is treated as a disease of childhood at page 332.

1463. ULCERATION OF THE CORNEA (par. 502) may be the result of extensive inflammation of the substance of the cornea itself, or it may be merely caused by the pustules, which are mentioned as common in strumous ophthalmia. In the former case the mischief is of a very urgent nature, and requires the most active treatment by the use of calomel and opium, and the loss of blood; but the niceties of distinction are too great to be mastered without great practice. If it results from the pustules, the treatment is that described under the head of strumous ophthalmia at page 332.

1464. RHEUMATIC INFLAMMATION OF THE MIDDLE COAT OF THE EYE (par. 504) must be treated in the same way as for *Acute Rheumatism* (see page 415).

1465. IN INFLAMMATION OF THE IRIS (par. 505), if the patient is not in too feeble a state, blood must be taken from the arm in considerable quantity, and the system rapidly brought under the influence of mercury by giving the following pills:—

Take of Calomel, gr. xvj.
Purified opium, gr. iv.
Confection sufficient to make eight pills,

one of which is to be given every six hours, until the mouth becomes sore. A blister may be applied to the back of the neck, or to the backs of both ears, and a shade must be regularly worn. (*This disease is so rapid and violent in its progress that not a moment should be lost in obtaining surgical advice.*)

1466. CATARACT (par. 506) can only be cured by an operation which is of three kinds—1st, *depression*, by which the opaque lens is pushed out of the way of the line of sight; 2nd, *the breaking of it up*, by which the aqueous humour of the eye is enabled to dissolve the fragments and remove them altogether; and, 3rd, *the extraction by the knife*, by which the lens is altogether, and at once, removed from the eye. The two first of these are done by a fine needle, which leaves no perceptible wound. The surgeon, who alone can master this delicate operation, will decide upon the comparative value of each, and its propriety, or otherwise, in any particular case.

1467. IN GLAUCOMA (see par. 507) very little benefit is likely to be derived from any efforts which may be made, and certainly not from those of the domestic surgeon. The effect of counter-irritation may be tried, by means of blisters behind the ears, and the iodide of potassium may be given internally, but with little prospect of relief.

1468. INFLAMMATION OF THE CHOROID COAT AND DROPSY OF THE EYE (pars. 508 and 509), are quite beyond the limits of domestic surgery.

1469. WHEN FLOATING OBJECTS occur in a dyspeptic subject, attention to the health, and especially to that of the stomach, may be expected to afford some relief.

1470. AMAUROSIS (par. 501), being a species of paralysis, must be treated on the principles laid down for that condition at page 460. A seton in the back of the neck, or the temple, or blisters behind the ears, will be the most likely measure to afford relief.

1471. THE TREATMENT OF SHORT SIGHT AND SQUINTING are discussed at page 333.

1472. CANCER OF THE EYE may be removed by extirpating the whole organ, which is an operation easily performed by the skilful surgeon, if the disease has not extended to the orbit.

SECT. 2.—TREATMENT OF DISEASES OF THE EAR.

1473. THE SCROFULOUS DISCHARGE FROM THE EAR occurring in children is included among their diseases at page 333.

1474. IF WAX ACCUMULATES TO SUCH AN EXTENT AS TO INTERFERE WITH THE HEARING, the plan of relief is to use a proper ear-syringe with soap and water. A strong lather should be made over night, as if for shaving, and with this the passage to the ear should be filled at night, keeping it in with a piece of cotton. Then, next morning, take an ear-syringe (which should hold from four to eight ounces, and should have a small tube or pipe) and inject into the ear about a dozen, or two dozen, syringefuls of warm water, in which some soap has been dissolved. A towel should be placed round the neck and over the shoulder, and an assistant should hold a basin closely against the neck, just below the opening to the ear. A little spout is made, with a spring to fasten it on, and sold for the purpose of conducting the water into the basin; but with a little tact in holding the basin close to the neck, there is no difficulty in avoiding an escape of water. In using the syringe care must be taken not to fill the whole passage with the pipe, but to allow the water to return with facility.

1475. A **Polypus** in the ear may be extracted with the forceps, by laying hold of it firmly, and twisting it as well as pulling at it steadily, it soon gives way. But the disease is better left to to the care of the surgeon.

1476. **Nervous Earache** is alluded to at page 334.

1477. **Inflammation of the Internal Ear** (par. 520), if it is clearly made out, may be treated by leeches and blisters to the outside of the ear, and by the use of lowering medicines internally, such as an aperient twice a week; but except in extreme cases it is safer to trust to the external applications mentioned above.

1478. **The Management of Foreign bodies** is given at page 334.

Sect. 3.—Treatment of Diseases of the Nose.

1479. **The Management of Bleeding from the Nose** (*epistaxis*) is alluded to at page 335.

1480. **The Removal of Foreign Bodies** is also treated of at page 335.

1481. **In Ozœna** (see par. 525), the application of one or other of the following lotions may be tried by sniffing them up into the nostrils; but the relief is seldom more than of a temporary nature:—

Take of Common alum in powder, ℥ss.
Water, ℥ij.

Mix, and shake well up before using; after which pour some of it into the hand, and draw it up into the nostrils several times a day;

Or, take of—
Chloride of zinc, gr. xij.
Rose water, ℥vj.

Mix, and use in the same way; or with a small syringe inject it *upwards* through the nostrils.

1482. **Polypus of the Nose** is treated in the same way as that of the ear (see par. 1475).

Sect. 4.—Treatment of Diseases of the Mouth.

1483. **Hare-lip, Cleft Palate, and Ranula,** are only fit for the surgeon to exercise his skill upon.

1484. **The Treatment of Cancrum Oris** is alluded to at page 335.

1485. **Ulcers of the Tongue** from the contact of decayed teeth, will often prove very obstinate until the cause is removed. Sometimes a light touch of the nitrate of silver will, however, succeed in effecting a cure without the aid of the tooth-instrument.

1486. **The Management of the Child during Teething, and of the Teeth afterwards** is alluded to at length at pages 297-8.

1487. **The Teeth in the Adult when Decayed** may be removed by extraction, or they may often be preserved by the process of "stopping" or "filling" with various substances. *The operation of extraction* is described at page 261. In *filling* the cavity made by decay in a tooth, it is indispensable that the whole of the carious matter shall be previously removed, if the disease is to be arrested, though there are occasional exceptions to this rule, as I have known many cavities retain their stopping for a series of years, when nothing could be done to them prior to the insertion of the amalgam, which was the material used. Still, it is admitted by all dentists that the best plan is to cut out all the decayed part; and, although it is a most disagreeable operation, I should certainly advise its being done whenever the central cavity of the tooth is still entire. The dentist, must, however, be left to do this, as it requires no considerable tact to perform completely, and without risk of injury to the remaining part. If, however, the tooth is much decayed, or if the possessor of it is at a distance from the dentist, the only plan is to obtain some quicksilver, and then by scraping or filing a shilling, an equal quantity of each must be mixed and well kneaded in the fingers till it assumes the consistency of putty, when the superfluous quicksilver must be squeezed out, by folding it in a piece of ordinary "cleaning" leather, and twisting this up into a scroll; then after wiping out the cavity with a piece of dry lint, the amalgam is pushed into it with some round instrument, and smoothed off, using as much pressure as the nerve will bear, and keeping that part as free from saliva as possible. Nothing should be eaten on that side of the mouth for twenty-four hours, after which the amalgam becomes hard, and in a few days it is as firm as it ever will be. But in no case is this protection so great as the gold-leaf, which is pressed in with great force, and when well burnished off is almost as complete a protection as the enamel itself. Still, the amalgam is better than nothing, and for domestic use is very valuable, when nothing else can be done. If neither extraction nor filling is practicable, a palliative remedy must be adopted; and for this purpose nothing answers so well as a grain of carbolic acid on a piece of cotton, and put into the cavity. It gives intense pain for a short time, but afterwards almost always affords complete relief for some days. If this is repeated again and again, the nerve is at length destroyed, and even the largest cavity may be filled with gold or amalgam. It requires great care to keep the acid from touching the gum, as it is a strong caustic.

1488. THE INFLAMMATION OF THE FANGS (par. 535) may be relieved by the application of one or two leeches to the gums close adjacent. The method of applying them is described at page 259 (*a*). They may be used every day until relief is afforded, but a single time of putting them on will usually suffice.

1489. A GUM-BOIL should be opened with a sharp pen-knife or lancet, as soon as it can be felt by the side of the tooth.

1490. NEURALGIC TOOTHACHE (par. 537) may be treated like ordinary *neuralgia* (see page 466). A poultice made of scalded laurel leaves, and applied to the side of the face, will often give some relief.

1491. RHEUMATIC INFLAMMATION OF THE JAW (par. 538) will often yield to the employment of the ordinary remedies prescribed for *Rheumatism* at page 416.

1492. COLLECTIONS OF TARTAR (par. 539) may be easily removed by the proper instruments (called *scaling instruments*), which consist of small steel scrapers of various forms, and by the aid of which the tartar may be scraped off the teeth. It will be found chiefly on the inside of the mouth, and, by a little patience, is easily chipped off by small portions at a time.

1493. SPONGINESS OF THE GUMS may be relieved by improving the general health, and by the use of a teaspoonful of the following wash, night and morning:—

Take of Tinct. of Cardamom,
Rhatany,
Myrrh, of each ʒij.
Alum, ʒj.
Borax, ʒij.
Eau de Cologne, ʒij.
Water, ℥vij,

Mix, and use a teaspoonful night and morning as a wash.

1494. WHEN A PORTION OF THE GUM rises above the adjacent tooth (par. 541), so as to fall between it and the one above, or below, it must be cut off with a gum-lancet or pen-knife, which may readily be done without danger.

CHAP. XXIII.

TREATMENT OF THE DISEASES PECULIAR TO WOMEN.

Sect. 1.—Treatment of the Diseases of the Unimpregnated Female.

1495. The general Management of the Young Girl at the Age of Puberty has been alluded to at page 167; and the treatment of *Anœmia* and *Chlorosis* at page 467.

1496. Amenorrhœa (page 168) must be treated differently, according as it is connected with a plethoric or with an anœmic condition of the system, and also, in accordance with the nature of the impediment, which may be purely *mechanical*, or the result of *previous inflammation*, or of *present congestion*, or of extreme *loss of blood*, or of the *bloodless condition* existing in *anœmia* and *chlorosis*.

(*a*) *When a mechanical impediment* exists to the establishment of the discharge, an operation may be performed which at once permits the proper flow; but of course this can only be done by a skilful practitioner of surgery, who should at once be consulted in any suspected case of the kind.

(*b*) *If after severe inflammation of the bowels* at any time, but especially in childhood, or if any inflammation of any other organ contained in the lower part of the abdomen has taken place, there is sometimes the greatest difficulty in establishing the natural secretion at the time of puberty, or in after life at the next proper period. If the constitution has been much weakened, it will be the best plan to wait until the strength is thoroughly re-established, and then steel with aloetic aperients may be tried, together with the regular use of warm hip-baths, continued for a week at the time when the discharge ought to take place, and omitted in the intervals. If the system is at all plethoric, six or eight leeches may also be applied to the inner side of the thighs. The following pills will be of service:—

Take of Compound aloetic pill,
Pill of iron with myrrh, ā ʒj.

Mix, and divide into twenty-four pills, one or two of which are to be given three times a day.

(*c*) *Where there are symptoms of congestion present at the time*, accompanied by a plethoric condition, iron is never proper; but aloetic aperients may be given two or three times a week, and the baths and leeches may be applied as directed at (*b*).

(*d*) *If the discharge has been established*, but is checked by a great loss of blood, or, in fact, by any lowering disease such as fever, no attempt to re-establish it should be made until the constitution has had time to rally. There will be no harm in waiting for some months, and if the complexion is still unnaturally pale, iron may be given as for anœmia (see page 467), or if the usual good looks are restored, the baths, aloetic aperients, and even the leeches ordered at (*b*), may be tried.

(*e*) *Where amenorrhœa exists in an anœmic, or chlorotic condition* of the system, whether the discharge has been established or not, it is prudent to give those remedies which are ordered for anœmia or chlorosis (see pages 467 and 468), and to postpone the use of baths and aperients until the colour of the complexion shows that there is blood to spare. It is not always desirable to wait until an appearance of blooming health is obtained, because that seldom is fully exhibited until the functions of the uterus are thoroughly re-established. But as soon as the positive evidence of anœmia has disappeared, aloes may be combined with the iron, and the baths may be adopted at the proper period, taking care to omit them in the interval; when on the contrary cold sponging, or the wet-towel rubbing (page 203), may be regularly employed as a means of bracing the system. When the discharge has once made its appearance, no effort should be spared to cause it to re-appear at the end of the month, by the use of baths, and of aloes combined with steel. There are several other remedies which have considerable power over the uterine functions, but they are not sufficiently free from danger to be entrusted to the hands of those who are not fully acquainted with all their effects, and the above are quite sufficient for all domestic purposes.

1497. DYSMENORRHŒA (see page 168) is only capable of domestic alleviation by the internal use of anodynes, by the employment of warm hip-baths, and by the rubbing in of anodyne liniments, or the application of similar plasters. The following *formulas* may therefore be tried; but if the case is a bad one, medical advice should be obtained, because, even if relief is afforded by these means, the continued use of them is prejudicial to the nervous system. The warmth of the bed is always an excellent remedy, while exposure to cold air has the opposite effect.

Take of Tincture of opium, min. xxv to xxx.
Sulphate of magnesia, ʒij.
Solution of carbonate of magnesia, ʒij.
Camphor mixture, ℥j.

Mix, and give as a draught when the pain comes on, repeating it every six hours till it ceases;

Or, take of—
Chloral hydrate, gr. iij to v.
Chloric ether, min. xv.
Sal-volatile, min. xx.
Water, ʒiij.

Mix, and take when the pain comes on.

Take of Veratria, ʒj.
Lard, ℥j.

Mix, and rub in one-eighth part around the hips on the night before the expected period, and repeat it every night till the pain has ceased;

Or, apply a large plaster of belladonna to the loins, sufficient to cover them entirely.

1498. MENORRHAGIA (par. 546) may be the result of a *plethoric condition* of the system, in which case it is almost to be considered as a salutary effort of nature; or it may be caused by a relaxed state of the vessels, so that the discharge is not checked at the usual time; or it may accompany organic disease of the womb, but in this last state it is to be strictly considered rather as a hemorrhage, than as an increased natural discharge.

(*a*) *When it occurs in a plethoric subject* it is not desirable to interfere unless the discharge is very profuse, so as to threaten loss of health at some future time. Even then it may be left to take its course for five, six, or seven days, and afterwards astringents may be adopted, such as the diluted sulphuric acid, which is generally sufficient. Everything should be given in a cool state, and great care must be taken in these cases that the liver acts properly, as congestion of that organ occurs in a large proportion of them:—

Take of Diluted sulphuric acid, ʒij.
Tincture of opium, ʒss.
Sulphate of magnesia, ℥ss.
Infusion of roses, ℥viiss.

Mix, and give two table-spoonfuls three times a day.

(*b*) *When it accompanies a lax fibre of the body*, tonics and astringents may be combined in any of the following *formulas*:—

Take of Sulphate of quinine, gr. viij
Diluted sulphuric acid, ʒiss.
Comp. tincture of cinchona, ℥j.
Infusion of roses, ℥vij.

Mix, and give two table-spoonfuls three times a day;

Or, take of—
Gallic acid, gr. iij.
Sulphate of quinine, gr. j.
Extract of henbane, gr. ij.

Mix, and make a pill to be given three times a day;

Or, take of—
Acetate of lead, gr. xij.
Vinegar, ʒij.
Tincture of henbane, ʒiss.
Liquor of acetate of ammonia, ℥j.
Water, ℥viss.

Mix, and give two table-spoonfuls three times a day. (*This should only be administered in urgent cases, at a distance from medical aid.*)

1499. The Treatment of Leucorrhœa is included among the inflammations of the mucous surfaces within the pelvis at page 380.

1500. Prolapsus Uteri is a mechanical falling down of the womb, which *may possibly* occur before marriage, but is usually a consequence of attempting to leave the bed too soon after delivery. The fact is that it requires at least ten days or a fortnight for the parts to recover themselves so as to bear the weight of the contents of the abdomen pressing downwards, independently of the enlarged condition of the womb itself, which also aids in this downward tendency. Those who carefully maintain the recumbent position for the proper time are seldom troubled in this way; and, on the contrary, in agricultural districts, where the women are so robust as to feel capable of getting up on the second or third day, this accident prevails to a frightful extent. Certainly in them the effect of *prolapsus* on the nervous system, though great, is not so serious as among the inhabitants of towns; but still it is enough to make life a great burden, and it should on that account be instilled into them, that their ordinary practice is very injurious, from its leading to this result. But, supposing a prolapse to have taken place—what is to be done? Three methods may be adopted—*one*, by which the disease may be radically cured; a *second*, by which it may be greatly relieved by astringent applications; and a *third*, by which the organ may be kept up, by an instrument called a *pessary* passed into the vagina, and retained there, or by an external pad pressing against the *perinæum*.

(*a*) *The radical cure* requires a surgeon's hand to perform it, and is, therefore, out of the question here.

(*b*) *The second mode of relief* is to be carried out by maintaining the horizontal position *strictly* for about three months, without raising the shoulders from the pillow, and especially taking care to avoid all voluntary efforts to raise the body from the bed. A mattrass should be chosen to place the patient upon, so as to avoid the necessity for "making the bed" continually, and then taking care to keep the stomach and bowels in good order, and to have all the evacuations passed in the bed-pan, so as to avoid all necessity for a change of position, the following injection is thrown up into the vagina night and morning. Of course it is to be supposed in such a case that the womb is returned, which, except in bad cases, is easily effected in bed, and it is only in slight ones that this mode of treatment is capable of effecting such a contraction of the passage as will prevent a recurrence of the prolapse. The greatest care must be taken to avoid the occurrence of solid motions during the treatment, and for many months afterwards.

Take of Gallic acid, ʒiij.
Decoction of tormentilla, ℥xij.
Sulphate of zinc, ʒij.

Mix, and use two table-spoonfuls for each injection. At the expiration of the three months, the position must be very gradually changed, and it will for a long time be right to use the injection every morning, lying down for an hour afterwards. It should never be employed during the period of the usual monthly discharge.

(*c*) *Pessaries* are of various kinds, but the best is the circular ring covered with India-rubber varnish. They must be large enough to retain their position without fear of being forced out, but a surgeon should always select them and apply them himself. They become decayed in the course of four or five months and should be renewed. In most cases a pad of vulcanized India-rubber may be substituted for the pessary; it is firmly strapped against the *perinæum* by means of an elastic band, attached before and behind to a belt round the waist, and being incapable of absorbing moisture it may be kept clean for any length of time.

1501. When the Ovary is enlarged from a dropsical effusion into a cyst formed in it, as evidenced by a swelling in the abdomen commencing on one side or the other, but not occupying the middle line, the case is too serious for trifling remedies, and should at once be submitted to the best treatment which can be obtained. Failing this, it may be desirable to apply leeches two or three times, and to give calomel in small doses, together with the iodide of potassium internally. An operation is sometimes performed for the removal of the whole mass entire, or the contents may be let out by tapping.

Take of Calomel, gr. viij.
Extract of henbane, gr. xij.

Mix, and divide into twelve pills, one of which is to be taken three times a day until the mouth is affected.

Take of Iodide of potassium, ʒj.
Spirit of nitric ether, ʒiij.
Water, ℥viiss.

Mix, and give two table-spoonfuls with each pill.

Sect. 2.—Treatment of the Diseases incidental to the Pregnant State.

1502. Abortion and Miscarriage (par. 548) may often be prevented by the adoption of great care during the three months which precede "quickening," (See *Pregnancy*, Part III.) It appears that at each monthly period, corresponding with those of the previous menstruations, there is more tendency to abortion and miscarriage than during the intervals, and, therefore, when there is a threatening of this accident, it is prudent to keep very quiet both bodily and mentally for a few days before and after that week. After "quickening" has taken place, the child rises above the cavity of the pelvis, and there is less risk until the end of the sixth month, when it appears that the tendency recurs, for in a great majority of cases, if the time of "quickening" is passed, the sixth month will be completed. When the signs mentioned at page 168 are presented, whatever the period may be, the patient should at once be confined to the sofa, and should in bad cases be even carried backwards and forwards to her bed. Every thing should be given quite cool, the bowels should neither be confined, nor should they be violently relaxed, and the mind should be kept as quiet as possible. Very often by the adoption of these measures alone the tendency disappears for the time, but at the next monthly period, even if there is no threatening, the same precautions should be taken, and these should be repeated until after "quickening." If there is any red-coloured discharge, and especially if actual blood comes away, there will be a necessity for something more active, such as the following:—

Take of Diluted sulphuric acid, ʒij.
Tincture of digitalis, ʒj.
„ opium, ʒj.
Infusion of roses, ℥viiss.

Mix, and give two table-spoonfuls three times a day. Beyond this it will not be safe for the domestic attendant to persevere, as it will be better to suffer abortion than to upset the health by injurious remedies, which, after all, will most probably fail. When a *miscarriage* is threatened in the same way and by the same signs, a larger dose of opium may be given, such as the following:—

Take of Pill of soap and opium, gr. v.

which is to be given when the pains come on, and to be repeated at the end of six hours if they are not relieved; but beyond two doses, it is not safe to use this powerful remedy.

1503. A Varicose Condition of the Veins of the Legs is a very common attendant upon pregnancy, and it is generally borne without any attempt at relief, in the hope that they will get well again after delivery. This, however, is so seldom the case, that I should advise the application of a common bandage, or of the elastic stocking (see par. 1420), in every instance where the veins are much enlarged, knowing by experience that if the veins are prevented from increasing at this time, they will return to their natural condition after delivery.

1504. The Sickness of Pregnancy may in most cases be disregarded, as far as medical *treatment* is concerned; but occasionally it is so incessant as to demand some remedy which will enable the poor sufferer to keep some small quantity of food on the stomach, and thus avoid the extreme emaciation and loss of strength which would otherwise result. The following remedies may be tried:—

Take of Bicarbonate of soda, ʒiij.
Solution of carbonate of magnesia, ℥ss.
Tincture of henbane, ʒij.
,, ginger, ʒiss.
Syrup of orange peel, ʒij.
Water, ℥viss.

Mix, and give two table-spoonfuls three times a day, with one of lemon-juice;

Or, take of—

Creasote, min. iv.
Extract of henbane, gr. viij.
Liquorice-powder to form four pills,

one of which may be given two or three times a day;

Or, take of—

Diluted sulphuric acid, ʒj.
Syrup of poppies, ʒiij.
Infusion of roses, ℥viiss.

Mix, and give two table-spoonfuls three times a day. But in most cases the best remedy by far is a disregard of the sickness, and a resolution to care as little as possible about it. In this way the patient may be sick two or three times a day, and yet, by determining to eat again as soon as the sensation goes off, which it soon does, the stomach at last gives in, and food is retained; whereas, by the opposite plan, it is kept almost constantly empty, and at last becomes so fastidious as to reject every particle of food.

1505. CONSTIPATION is best relieved by the use of the simple pills of rhubarb, &c., ordered at page 347, or by castor-oil given every other day if necessary. Almost all of the usual aperient pills contain aloes or colocynth, both of which act too strongly upon the lower bowels to be safe in pregnancy. Enemas also cause too much straining to be very available in this condition.

1506. IF THE ABDOMEN IS VERY PENDULOUS, so as to hang over the bones below, an elastic support must be employed, which may be either made entirely of the Indian-rubber webbing, or of jane and whalebone, with sections of it inserted at the side, which latter method is generally preferred from its greater coolness. The instrument-maker will furnish either as ordered, upon sending the measurement round the hips and height of the whole body.

SECT. 3.—MANAGEMENT OF LABOUR AND OF THE ACCIDENTS INCIDENTAL TO IT.

1507. THE QUALITIES OF THE NURSE and other attendants at the time of labour are of great importance to the well-being of the patient. The society of a female friend is no doubt a consolation and comfort in these trials, but that one which seems to be the most frequently selected is generally the worst adapted to afford it. A daughter naturally looks to her mother, and she should do so certainly, now, if the mother's feelings could always be controlled; but in these circumstances it generally happens that she feels too much, and is consequently unable to keep up the spirits of her charge, so that, instead of exhibiting a cheerful and encouraging countenance, she is inclined to emulate the patient in giving way to her tears. If all goes well it matters little who is by; but, in case of any complication, she is very properly consulted, and is unnerved and anxious, instead of showing calmness and confidence. All this re-acts upon the patient, and for these reasons, which I have seen exemplified in scores of cases, I should never advise the selection of a mother as a comforter at the hour of trial, unless she is of unusually firm nerve and calm disposition. It is not desirable that she should be merry, for nothing is so aggravating as a light, careless tone at these times; but that she should be able to control her feelings is of the utmost importance. Men are always in the way, and the more the husband can be ignored the better. Of course, his natural anxiety will keep him within reach; and if he is ready to act in case he is wanted to fetch assistance, it is all that he can or ought to do. Every one at these times ought to have the assistance of a competent person, who is initiated into the mysterious processes connected with the birth, washing, and dressing of a child; and, therefore, they may well be passed over, and we may assume all this done, and the first day of the young thing's life completed. Afterwards, however, begins a part in the management of both mother and child, which is of no little importance, and requires the superintendence of both doctor and nurse, who should, if possible, pull together. In the present section, the treatment of the mother is the part which will be described; and in this account it may be necessary to remark, that the day after the confinement is reckoned the *second day*—the day after, the *third*, and so on.

1508. ALTHOUGH THERE ARE SOME COMPLICATIONS which happen in the most healthy women during labour, in spite of the best management, yet a great many of them are due to some absurd or careless practice which may easily be avoided, and for this reason I shall here insert some directions which may be of service at all times, but which are especially necessary when a labour has to be encountered at a distance from all medical assistance.

1509. IN A HEALTHY FEMALE, NATURAL LABOUR requires little or no interference, excepting the attention which is required to remove the child by dividing the cord, and to get rid of the discharge which accompanies the process. The following directions will serve for those who may not have had any experience in these matters.

(*a*) *When labour is coming on*, there are generally some warnings in the shape of slight pains in the back, and a general falling down of the child into the pelvis, by which the region of the stomach is relieved of the pressure which has been going on for some time. A very short time before actual labour commences, there is usually a discharge of a little mucus stained with blood.

(*b*) *The bed should be "guarded"* by a skin of leather or a piece of waterproof material beneath one or two blankets, and a sheet folded two or three times. This waterproof material is allowed to remain for about a week, or till it is no longer needed.

(*c*) *The bowels* should be regulated by castor-oil, avoiding constipation as well as excessive action.

(*d*) *The patient should not take to her bed* until labour comes on, as the sitting or walking position assist the action of the *uterus*.

(*e*) *The diet*, until labour is completed, may be as usual, and brandy and water, or brandy in tea, may even be taken to the last, if there is much weakness, but afterwards it must be altogether discontinued.

(*f*) *In healthy women there is always a considerable discharge* of a clear fluid resembling water in appearance, but containing albumen. This is popularly called "the waters," and either comes away some hours before labour or during its progress. It is contained between the child and the membranes enclosing it, so that until these last have "broken" (commonly called "the waters breaking") a soft tumour presents itself in the maternal passage. The quantity of this fluid varies greatly in different instances, and it appears to be a provision against unequal pressure upon the parts of the child which would be exercised without it, and it also serves as a safeguard against accidental blows; in addition to which, the soft and yielding tumour formed by the membranes distended by this fluid dilates the mouth of the womb, which necessary process is thus effected almost insensibly. From the moment that "the waters break" and escape, the womb is stimulated by the points of the limbs of the child touching its interior instead of the regular pressure afforded by the fluid, and labour from that time progresses more rapidly. Hence it has been the custom among impatient attendants to rupture the membranes with the finger-nail, in the hope of accelerating the process, but this should never be done without some more important purpose in view.

(*g*) *As soon as the pains of labour* are very great, the patient is usually placed on her left side near the edge of the bed, and when no medical aid is at hand, she is better left to her own powers until the child is born, the nurse merely placing a pillow rolled up tightly between the knees so as to give room for the child. As soon as it is born, the navel-string should be tied *tightly* about three inches from the child, and again two or three inches farther on, after which the cord is divided between the two ligatures; and after carefully examining that there is no bleeding from the end attached to the child, the latter may be removed and dressed.

(*h*) *After removing the child*, a broad bandage or towel should be pinned or tied tightly round the hips, so as to keep up some degree of pressure upon the parts which have so long been accustomed to it, and thus stimulate the vessels to return to their natural condition. Then taking hold of the cord it is to be *very gently* pulled at to see if the *after*-birth will come away, and if it does, without any force more than its mere weight will occasion, it may be removed at once. On the other hand, if it remains, it may be gently twitched every five minutes, taking care not to use such force as is likely to tear it. If in spite of these aids it is retained, at the expiration of a couple of hours the hand must be oiled and passed into the womb, where it can readily grasp the after-birth and cautiously (*and without breaking it*) detach it from its adhesion to the womb, when the whole may be brought away, allowing the hand to remain until an "after-pain" comes on. At this time there is always a discharge of blood, varying from a few ounces to some pounds, even in healthy and natural labours.

(*i*) *When the after-birth* does not readily come away, or sometimes when it does, there is a frightful "*flooding*," as unusual bleeding at this time is called. In such a case cold applications of vinegar and water to the hips and thighs, by means of linen dipped in it, may be kept up; and if there is flooding in small quantities for a long time, a stream of cold water may be forced up into the womb by means of the common enema-syringe. At the same time, if the loss of blood has caused fainting, brandy or sal-volatile may be administered in sufficient doses, whatever they may be. Pressure by one hand on the lower part of the abdomen is most effectual, and the stimulus of the other applied to the interior of the womb will often do more good than anything else, by causing it to contract, and thus mechanically close the bleeding vessels.

(*j*) *As soon as the flooding* has ceased, if it comes on (or when the after-birth has come away, if there is none), the patient may be made comfortable by adjusting the upper bed-clothes, and removing any of the discharge which can be reached without lifting her at all. She should be suffered to lie quite at rest for at least six hours, after which the soiled blankets, &c., may be changed, as well as her body-linen, but without raising her from the bed. This is easily done by carefully shifting her from one side of the bed to the other.

(*k*) *If the after-pains are violent* at the expiration of six hours from delivery, an anodyne draught may be given, and repeated in six hours, if necessary. They are seldom very severe in the first labour, but gradually increase in amount with each succeeding pregnancy.

Take of Tincture of opium, min. xxv.
Water, ℥j.
Mix, and give as ordered above.

1510. UNNATURAL LABOURS require assistance, which, if possible, should at once be sought at the hands of the experienced *accoucheur*; but sometimes it is impossible to obtain any help, as on board ship or in distant colonies; and under such circumstances the following directions may possibly serve to guide any person of good nerve and ordinary tact who may be placed in such a fearful position. Nature, however, will do much even unassisted; and it is astonishing what is borne by the female in delivery when left to herself; still it is hoped that an intelligent person may sometimes be able to save a valuable life by keeping as closely as possible to the annexed directions:—

(*a*) *If the labour is prolonged* more than twenty-four hours from the first appearance of severe pains—that is to say, if the pains have gone on during that time—there is either a disproportion between the child and the passage, or there is a cross-birth, or there may be a peculiar rigidity of the mouth of the womb, which, however, seldom occurs, except in first labours. If the mother is very small in the bone, or was a ricketty child, or if she is very narrow across the hips, it may be suspected that the bony passage is small, and all that can be done is to wait patiently, and support the strength of the patient, while the powers of nature mould the child's head into such a form as to pass the outlet. In such a case, if the labour has gone on for more than thirty-six hours, and the strength is greatly exhausted, thirty drops of laudanum in a little weak brandy-and-water may be given, in the hope of gaining a short interval of rest, during which some sleep may be obtained, by which the exhaustion is greatly relieved, and afterwards the pains come on with renewed vigour and effect.

(*b*) *There are several kinds of cross-birth* which retard the progress of labour; but all of them may be left to the powers of nature, except that in which the hand and arm make their appearance. Here it may always be assumed that death will take place, from a want of delivery, if the woman is not assisted; and, therefore, as soon as the hand can be made out clearly, the attendants must make up their minds to do what is required, or to let death have full sway. Delay makes matters worse every minute; but it is very important to distinguish the hand from the foot, the appearance of which is comparatively of little importance. Supposing, however, the hand to be evidently presenting, the following operation called "turning" must be attempted:—First remove everything from the arm, then oil the hand, and forming it into a cone, introduce it steadily into the womb in the intervals of the pains, at which time every other proceeding of the same kind is also to be carried out. Next search quietly and cautiously for the feet, or for one foot only, if both cannot be found, and having grasped one or both, draw them gradually down into the passage, where the operation ends, and the labour may be left to nature to complete her work. It is usual to withdraw the child still further by drawing on the legs; but in such a case as the one we are now considering, there is no necessity for doing more than has been already described, and there is then no danger of the premature delivery of the child occasioning flooding or exhaustion. Sometimes considerable force is required in order to reach the feet; and in using it, from the pressure of the womb while contracting, the hand of the operator becomes cramped in a most painful manner; but this must be disregarded, and the search must be steadily continued until the "turning" is effected, remembering always that it is a case in which failure is death, and in which no pains should therefore be spared to effect the object in view.

(*c*) *If in a first labour* there have been very strong pains for more than twenty-four hours, and by passing the finger into the passage the mouth of the womb is felt to be hard and rigid, with an opening no larger than the end of the finger, it may be presumed that interference is required, in consequence of the womb refusing to open and allow the escape of its contents. In such a case, if the patient is plethoric, it will be prudent to take away about twelve to sixteen ounces of blood, and afterwards to give a full dose of laudanum, that is, from thirty to forty drops, together with a table-spoonful of castor-oil, or such a quantity of that medicine as will be likely to act, according to the habits of the individual. By these means it is to be hoped that, after a few hours sleep, relaxation of the parts will take place, and labour will go on as usual. If otherwise, the dose of opium must be repeated, with the addition of a warm hip-bath for at least half an hour, and this will probably serve the purpose of procuring relaxation. At all events beyond these measures, it is not safe for any inexperienced person to push the treatment; and nature must be left to do her own work, which she will probably do with a little patient waiting upon.

SECT. 4.—TREATMENT AFTER DELIVERY AND MANAGEMENT OF THE LYING-IN ROOM.

1511. From the time that the labour is over until the secretion of milk is either thoroughly established or completely checked, the *diet* should be light, but not stimulating. On the second or third day, the breasts become full, and there is some degree of fever, which, indeed, is only the natural effort to produce the new supply for the support of the child, and for this reason, it is not to be wished that it should be altogether absent, but only that it should be kept within safe bounds. Indeed, in this, as well as in other respects, the management of the mother after her delivery requires considerable judgment, because she is lying in a state wholly different from ordinary disease, and yet demands quite as much care as if she were afflicted with it. The truth is that, in healthy young women, there is nothing beyond a natural process, which merely requires eight or nine days' rest in the recumbent position, with two or three of low diet, to remove all risk of dangerous consequences. It is only in those who are diseased or distorted that mischief should be expected as a regular result; and in them extra precautions ought to be taken. That unnatural development of the nervous excitability which is sure to attend upon high living with little exercise, and accompanies those who indulge in heated rooms and midnight dissipations, may be looked upon as disease; and it is in those who are subject to these particular conditions of the nervous system that the most serious complications occur. But leaving these out of the question, I shall now proceed to describe the proper domestic treatment at these times, by the aid of which ninety-nine healthy women out of every hundred may be brought through the period we are now considering, without requiring more than a dose or two of castor-oil.

1512. A CERTAIN DEGREE OF QUIET is desirable, but it is a very common mistake to darken the lying-in room, and shut it up closely from the air. Both of these plans are prejudicial, inasmuch as they increase the irritability of the nervous system by depriving the eyes and lungs of their proper stimulus. Unless, therefore, the brain is affected by convulsions or their premonitory symptoms, the light should not be darkened, and the room may be made cheerful and airy, though still warm enough for the young infant, and also so comfortable as to allow of the mother's arms being out of bed, which, I believe, is a good practice in almost all cases.

1513. THE STRICT MAINTENANCE OF THE RECUMBENT POSITION is the most important of all the precautions to be taken, and without it no one can for a single day calculate upon a freedom from inflammation. The column of blood above the pelvis is of considerable height, to say nothing of the force of gravity in other matters; and this column acting downwards fills the vessels, and causes a tendency to congestion or inflammation, which leads to the most serious results. From a long experience I am convinced that a woman will do better, if she neglects every other precaution and attends to this, than if she runs counter in this respect, and is perpetually sitting up in bed, or even walking about her room. On the second day, many women feel so strong and well that they are tempted to get out of bed "to feel their legs," and fancy they are quite themselves again; but so surely as this is attempted comes a reckoning on the third or fourth, at which time they can scarcely sit up from pain or other inconvenience. It is a great trial of patience, I allow, and appears for the first ten days to cause great loss of strength; for even a person in perfect health cannot lie down for nine days strictly without feeling faint at first sitting up or walking. This, however, soon goes off, and at the end of the fortnight the strength is regained to a much fuller extent than if the bed had never been kept at all. Every succeeding confinement makes this position still more necessary, for reasons which every mother will readily comprehend. Let me therefore repeat, that every woman who wishes to regain her health entirely, *without any discomfort or drawback*, should never raise her shoulders off her pillow for nine days after her delivery; and the same applies to a miscarriage—in fact, the rule is even more necessary at that time than at the other.

1514. THE ESTABLISHMENT OF LACTATION is the turning point of the lying-in room, upon which depends the freedom from fever or inflammation in most cases. In a state of the highest health, this process is ushered in by a slight accession of fever; and if that does not show itself, the lactation is imperfect; or if it is allowed to run on too far, the secretion is forthwith checked. As a consequence, it may be inferred that it is desirable to avoid too great a depression of the system on the second day; but the moment the feverish symptoms appear, quiet and starvation are the essentials to success. A little cheerful conversation, and sometimes in delicate patients a basin of chicken or veal broth, may be allowed on this day, unless the breasts are becoming full, or there is evidence of fever in the increased frequency of the pulse. The safest plan, in most cases, is to keep to tea and bread and butter, with gruel only, until after the breasts are quite soft and comfortable. Aperient medicine should never be given until the milk is making its appearance pretty freely, which is generally on the morning of the third day, when a dose of castor-oil will almost always be needed. If, therefore, there is an impediment to this secretion, the aperient must be postponed until the fourth day, and the food must be improved to such an extent as is advised by the medical attendant. By impediment to the secretion of milk is not to be understood any obstruction in its *flow*, for that would be a most injurious mistake, requiring exactly an opposite treatment. The secretion for its establishment demands a slight increase of the powers of the system beyond their usual condition, and if these are not inclined to rouse themselves, they must be aided in the way I have mentioned; but when once the breasts have become full and hard this stage is accomplished, and the efforts of the nurse must now be directed to procure the flow of the milk by all the means in her power, unless it is determined to avoid suckling, when the opposite course must be taken. *To procure the flow of milk*, so that the child can help itself, is an art not easy of acquirement without the actual demonstration of one who has already achieved it. It may be supposed by some people that nature has provided the child with power to get its own supply, and so in all probability she has in her own dominions; but, in the present state of society, from the pressure of the stays carried through several generations, the nipples are so shortened and injured in their development, that, if left to itself, many a child would actually starve. This I have myself tried on more than one occasion, having imbibed the theory, among many others of a similar kind, that the child would sooner or later manage for itself. The worst part of the predicament is, that every hour's delay makes it more difficult for the child; and there is no help, unless the nurse or some other person sets to work and brings away the first part of the secretion, after which the child fastens readily enough. But in this there is great difficulty, because there is an absence of that natural "draught of milk" which is caused by the desire of the mother to afford nourishment to her baby. The same difficulty is sometimes experienced in milking the cow, who often takes a dislike to her milker, and will not give down her milk; not that she has any muscular power by which she can restrain it, but she does not desire to yield it, and, as a consequence, it is not yielded. Even if a strange child is brought to the young mother to perform the office, and has twice or thrice the strength of her own, the instinctive reluctance to give sustenance to a stranger is still in play, and, in the language of the nursery, "the draught does not come." The nurse *must*, however, persevere, either with the aid of pumps or the mouth, in drawing out the nipple; and to aid this, steady and pretty strong pressure of the base of the breast is the best means in her power. Taking one in both hands, and, as it were, raising it from the ribs, she surrounds its base, and steadily, yet without undue force, she proceeds to force out the contents, using suction at the same time with the pump or mouth. The India-rubber pump, or the new American machine, are far the best for this purpose, as their exhausting power is more steady than that afforded by the human hand, or the old glass tube used with one end in the mouth. By persevering in these plans, together with a gentle rubbing of the breast, the milk is generally made to flow tolerably readily, and as soon as it does so the child should be applied; but for the first three or four days it will be necessary to begin, and *end* also, in this way each time the child is to be suckled, as it is very important to empty the breast completely. At this early age the child will require the breast every two or three hours, which, taking them alternately, will relieve each every four or six hours.

1515. IF THE BREASTS ARE TO BE DRIED, it will be necessary to begin the morning after delivery, by rubbing them with equal parts of spirit and oil. The latter is only useful to aid the friction, which should be steady, slow, and deep, not of the surface only. The spirit may be either camphorated spirit, or brandy, or whisky, or eau de Cologne. Some nurses use a stimulating plaster; but the friction with oil and spirit is far the best plan. If they become very full and hard, or what the nurses call "wedged," it will sometimes be necessary to relieve them by the method of drawing described in the last paragraph. During the stage in which this drying process is going on, and until the milk is comparatively gone, the diet must remain low, consisting of bread or toast and butter, with a small quantity of tea or coffee, and a light pudding for dinner.

1516. AS SOON AS LACTATION is established, the diet may be rapidly improved; indeed it is now the fashion to let the lying-in woman from the first go on with the food she has been accustomed to before her labour, both solid and liquid. This, no doubt, answers well in London and the large towns, when no exercise has been taken for weeks beforehand; but among the more robust women of the provinces it would be almost sure to produce fever, and with them a reduction of diet till the secretion of milk is established is essential. On the tenth day, the nurse should get her mistress dressed without stays, and let her reach a couch, to which she will probably have some difficulty in walking; but gradually increasing her distance, in a day or two there will be no difficulty in progressing about the room, or on any level ground. During the whole time of suckling, the diet should be highly nourishing, but not heating. Many mothers are able to produce milk enough for their children without any food but that afforded by meat, bread, and vegetables, together with tea and milk; but others, who have always been accustomed to fermented liquors, cannot be made to supply enough without it. Although, therefore, in *theory*, alcohol is of no use in forming milk, which is full of nitrogen, and cannot therefore proceed from the alcohol, yet it is in some way serviceable in producing it, and probably by its stimulating effect upon the nervous system. I have often tried water only, and have found in many cases that without malt-liquor the milk is scanty and poor; whereas the addition of a pint or two of that article will cause the secretion of twice the amount of milk, which at the same time is vastly improved in quality. Meat and meat-soups, milk, and especially weak tea, with plenty of milk and sugar in it, are the best forms of diet, and in addition, good fresh malt-liquor, free from the adulteration of the public-house. I am, however, quite satisfied that milk produced by the over-stimulation of large quantities of stout or wine is much more unwholesome to the child than artificial food; and the mother who has recourse to them to avoid that alternative does harm to her child as well as herself. It is far better to wean the former, and trust to dry-nursing, than to fill it with milk the produce of a system saturated with alcohol.

1517. SOME MOTHERS ARE TROUBLED WITH AN EXCESSIVE FLOW OF MILK, by which they are exhausted to a terrible degree. Extra support by food and malt-liquor often seems only to increase the flow, and does quite as much harm as good. When, therefore, this state is carried to excess, it is better to wean the child, and give up the suckling altogether; but, if possible, the attempt should be made to keep up this kind of support to the child until it is five or six months old, as by that time it has gained strength, and can bear weaning with impunity. Bark seems to exercise some little power over this excessive flow; but it cannot be depended on as an effectual remedy, nor is there in the whole range of the *Materia Medica* any drug which is serviceable to any great extent without possessing powers so great and obnoxious to health as to produce worse mischief than the original state for which it is to be used; if, therefore, simple remedies are not efficacious, the only plan is to wean the child.

SECT. 5.—TREATMENT OF THE DISEASES WHICH ACCOMPANY OR FOLLOW PARTURITION.

1518. ABSCESS OF THE BREASTS, or *milk abscess*, is very apt to occur, and may be the consequence of a neglect on the part of the nurse to "draw" the breast properly (see par. 1514), or it may sometimes take place, in spite of every care and good management, in those who are peculiarly liable to inflammation, and especially in scrofulous subjects. Still I think that in most cases, even when the predisposition is great, it may be prevented by constant attention to the state of the breast, and by the adoption of the method of emptying it described at page 503. If, in spite of these measures, there is still a hard and painful swelling, six or eight leeches may be applied, and repeated if necessary; but if the inflammation is not speedily reduced, it is better to apply a poultice of linseed-meal, and hasten the formation of matter. Sometimes the abscess is inclined to spread extensively beneath the skin without coming to a point; and in such a case it is better to open it, but otherwise no good is done by that operation. When the matter is discharged either naturally or artificially, the opening should be prevented from closing by inserting in it every day a piece of lint twisted into a round "tent" as it is called, and smeared either with the matter itself or with some common ointment. For some days after being opened, the breast should be still poulticed; but afterwards, it is better to dress it with the ointment of nitric oxide of mercury.

1519. SORE NIPPLES are a constant source of pain and annoyance, and in some women no precaution will prevent their appearance. Frequent suction previous to delivery is the best remedy, as it accustoms the skin to the alternations of moisture and dryness, which seem to occasion this state. A common cause is the mismanagement at the time of the milk first coming, when anxious mothers and nurses are too apt to be constantly meddling with them, by putting the child to them, and other experiments. The nipple should always be allowed from four to six hours' rest; and when this is done, it will seldom give way. If, however, in spite of every precaution, it becomes chapped, the best remedy is glycerine, which is neither disagreeable to the mother, nor dangerous to the child. It gives little or no pain, and may be kept constantly applied, first wiping the cracks quite dry with a soft piece of cloth or muslin. If the Belmont glycerine is used, it is so devoid of smell as to occasion no disgust even to the most sensitive nose. Collodion is also a very useful remedy, but it occasions very considerable smarting, and is not equal to the glycerine. *In order to avoid the above troublesome condition of the nipples*, many pregnant women wear shields or glasses, which take off the pressure, and encourage the development of the nipple; but although this may be of some slight use, it is not adequate to the task, even though aided by suction, either natural or artificial; and there will be nearly as much difficulty at last as if no steps had been taken. During lactation, however, they may be worn to encourage the continuance of the nipple in a prominent form; though even then half a minute's suction does more than an hour's wearing of the shield.

1520. THE STATE OF THE DISCHARGE at this time, called "*the lochia*," must be closely attended to, because it forms an excellent indication of the healthy process of recovery which ought to be going on in the womb. For the first four or five days it is a still a dark red, but then it gradually becomes paler, and at the end of a week is of a greenish colour with a tinge of pink. It is now popularly called "the green waters," and retains this colour until it disappears, which it does almost entirely in the fourth week. Those women, however, who stand, sit, or walk much during this time, or who rise from the recumbent position too soon, are seldom free from discharge for six weeks, or even still longer, and in them there is often seen a tinge of decided red in the colour of the discharge, or even an appearance of blood itself in clots or streaks. This is generally visible after a night's rest, *but is due to the exertions of the previous day.* When this regular progress of the discharge does not go on properly, there is congestion or incipient inflammation, and it will be desirable to effect its restoration by fomentations of hot water, aided sometimes by half a tea-spoonful of spirit of nitric ether in a glass of water. Of course, if inflammation is the cause, it must be treated as such (see par. 1524).

1521. A HIGHLY IRRITABLE OR EXCITABLE CONDITION OF THE NERVOUS SYSTEM is very common among the inhabitants of cities, chiefly owing to the mismanagement of the mind and spirits after the delivery is accomplished. Cheerfulness imparts confidence; but it should not be carried to the length of exciting the brain by means of long conversation in the early stages of convalescence. At the same time, to be compelled to keep completely silent is very annoying in itself, and a due medium between the two extremes is the part of a skilful and trustworthy nurse.

1522. PUERPERAL CONVULSIONS (page 169) may occur during pregnancy; but they usually come on after labour has commenced, or directly after it is completed. The complication is a very terrible one, and should always call for the immediate attendance of an experienced *accoucheur;* but, for the same reasons as I have before given, some directions for their *treatment* will be here afforded. They have been described at par. 553 as either of the nature of *hysteria*, *epilepsy*, or *apoplexy*, and for each of them the treatment must be different.

(*a*) *In hysterical convulsions* coming on at this period, it will not often be necessary to interfere further than to give a tea-spoonful of sal-volatile in a little water, or to dash some water in the face, or to use the wet towel as ordered at page 480. But great caution must be exercised in distinguishing this form of convulsion from the other two (see par. 553).

(*b*) *In the epileptic convulsion*, which is by far the most common form, the danger is so imminent that no time should be lost in taking away a considerable quantity of blood, either from the arm or the temporal artery (see page 258). The amount must greatly depend upon the state and strength of the patient, but it should be sufficient to cause faintness; and if the convulsions do not cease, it may be repeated, or leeches may be applied to the head. A strong mercurial purgative (see page 348) should then be given, and a blister should be applied to the nape of the neck; while the hair should be cut short, and a cold lotion should be applied to the head. If the convulsions subside at all, the friends may content themselves with the administration of the following pills:—

Take of Calomel, gr. vj.
Tartar-emetic, gr. ij.
Powdered opium, gr. iij.
Confection enough to form six pills,

of which one is to be given every six hours. (*If by these means the fits can be kept in abeyance, and delivery accomplished, the case may do well.*)

(*c*) *In the apoplectic form of convulsion*, the treatment must be nearly the same as in the last mentioned variety, except that the opium is not to be given in any dose whatever.

1523. PUERPERAL MANIA, when it occurs, seldom requires the loss of blood from the arm; but leeches to the temples, blisters to the back of the neck, cold applications to the shaved head, and mercurial aperients, are the proper remedies to be adopted.

1524. PUERPERAL FEVER (see page 169) requires all the experience and skill of the practised accoucheur to treat it properly; and it is, therefore, almost a hopeless task to attempt to describe its management in such a way as to be useful to the ordinary attendant. If, however, in the early stage, there is much pain on pressing the abdomen, it may be considered right in all cases to bleed pretty largely, and to give a full dose of calomel (five or six grains), followed by a dose of castor-oil in a few hours. If the pain continues, leeches may be applied to the abdomen, and calomel and opium may be given every four hours in grain doses of each, unless the pain subsides. When there is great swelling of the abdomen, the turpentine enema may be administered (see page 344), and the turpentine liniment (par. 1150) may be rubbed into the abdomen. *On the other hand*, if the fever is of a low type, resembling typhus fever in its symptoms, bark and ammonia should be given from the first appearance of these signs, and all lowering remedies must be abandoned. The bowels may be well fomented, so as to encourage the discharge, and a large linseed-meal poultice to the abdomen will sometimes afford great relief. Beyond these general directions it is impossible to afford any useful information; but fortunately these attacks seldom occur, excepting in cities where professional aid may always be obtained.

1525. WHITE LEG, or *phlegmasia dolens*, consists in a swelling of one or both legs shortly after delivery, accompanied by pain and tenderness on pressure. It generally attacks delicate women, and always begins during the first fortnight after delivery. *The first symptom* is usually pain in the lower part of the abdomen, which soon extends to the groin, and down the thigh; and in the same course a swelling of the skin shows itself in a day or two, the thigh gradually becoming tense, swollen, and *of a smooth, shining, white colour*. There is not much heat, and the skin usually pits, except when it is very hard and tense. The constitutional signs are a quick, weak pulse; tongue white and coated; with thirst, loss of appetite, and restlessness. In course of time, all these appearances gradually subside, or matter forms in various parts of the leg, exhausting the patient by the amount of the discharge. The *treatment* consists in the application of several leeches to the groin once or twice, or even more frequently, and at the same time small doses of calomel and opium should be given with an effervescing saline mixture as follows:—

Take of Calomel, gr. vj.
Powdered opium, gr. iij.
Confection enough to make six pills,

one to be given every four hours, with a dose of the annexed mixture:—

Take of Bicarbonate of soda, ʒij.
Spirit of nitric ether, ʒiij.
Acetate of potass, ʒss.
Syrup of orange-peel, ʒij.
Water, ℥v.

Mix, and give two table-spoonfuls with one of lemon-juice. A large linseed-meal poultice may be applied to the whole leg, or it may be wrapped up in carded cotton; and sometimes the use of spirit of turpentine rubbed into the skin gently, and then wrapping all up in cotton, has been followed by a rapid improvement. The *diet* must at first be rather low, but after the first few days nourishing broths should be allowed; and when the strength is much exhausted, small quantities of port-wine in arrowroot or gruel will often be required. At this stage, also, bark will be of service, and very often it seems to cut short the disease. When the leg remains in a chronic condition, carriage-exercise, or sea-air and warm sea-bathing, will in the majority of cases hasten the complete recovery.

CHAP. XXIV.

ON THE TREATMENT OF THE EFFECTS OF POISONS.

SECT. 1.—THE USE OF THE STOMACH PUMP.

1526. ALTHOUGH THIS INSTRUMENT should in general only be employed by the surgeon, yet there are instances in which it may be necessary to intrust it to some unprofessional person, especially in remote colonies, where there is often an individual who is employed in the care of animals, and who is constantly in the habit of using similar instruments, though on a larger scale, for their relief. These persons may well, therefore, be allowed to try what can be done to afford their aid in discharging any virulent poison which would otherwise be certain to cause death, and as the enema-syringe, which every one should possess, merely requires the addition of a single elastic tube and a wooden gag to convert it into a stomach pump, no emigrant should fail to complete the instrument. In using it, the instrument *fig.* 5, page 266, is first put together as there shown; but instead of the short enema pipe, which is fixed on the elastic tube as there drawn, this should be taken off, and the elastic stomach or *œsophagus* tube should be fitted on; then the gag should be placed between the teeth, and the tube boldly passed backwards and steadily pushed down the throat until there are only about five or six inches of it out of the mouth; then pump into the stomach about a quart of warm water, and disconnecting the *œsophagus* tube from its junction with the other, attach it to the lower end of the syringe, which in the basin is dipped into the water; then pump again, and the contents of the stomach will be brought up and discharged. When the amount pumped in has been brought up, the action must be again reversed and more water must be pumped into the stomach as before, and the operator must take care not to use any force in pumping the water *out of* the stomach towards the end when it is nearly empty, or he may draw the mucous coat into the eye of the tube and do great mischief. By repeating these operations several times, the stomach is thoroughly washed out; but solid food cannot be removed in this way, and nothing but an emetic will have the power of effecting it.

SECT. 2.—TREATMENT OF THE EFFECTS OF IRRITANT POISONS.

1527. CONCENTRATED SULPHURIC, NITRIC, AND MURIATIC ACIDS (page 171) are to be treated alike—*first*, by the administration of *antidotes;* and *secondly*, by such means as will allay inflammation. As their action on the stomach is immediate, there is no time for their removal by the application of the stomach-pump or of an emetic.

(*a*) *The most accessible and immediate antidote* is water, which should be swallowed in large quantities, but is never in time altogether to prevent the burning action of these powerful acids, and the dilution can only be expected to avoid a fatal amount of mischief. The acid is, however, still in existence, and if the quantity swallowed was considerable, it will cause intense inflammation, so that it must be neutralized by the most accessible base, and as old mortar is that which is most likely to be so, it is to be at once sought for, either in the plaster or ceiling of the room, from which a lump may be chipped and powdered, or from any other source. Carbonate of magnesia will answer if at hand, or a strong solution of soap; but carbonate of soda and potass must be used with great caution, as in large doses they are strongly irritant.

The *Directions*, therefore, are—1st, to dilute with water; 2nd, to neutralize the diluted acid with old mortar powdered, or with carbonate of magnesia, or a strong solution of soap, or carbonate of soda, or potass, *if the acid is in very small quantity*; and, 3rd, to treat the subsequent inflammation by means of bleeding, either from the arm, or by leeches to the pit of the stomach. These may be followed by blisters to the same part, and by the use of the most emollient medicines and food. Diarrhœa is generally produced, which may be checked by the following mixture:—

Take of Chalk mixture, ℥viij.
Tincture of opium, ʒj.

Mix, and give two table-spoonfuls every four hours, or oftener if necessary. Sometimes, however, the bowels are confined, and then it will be prudent to try the effects of enemas, which will usually act without resorting to aperient medicines. Ice also, or iced water, may be given, and this is, perhaps, the only remedy which should be employed *internally*, with the view to relieve the inflammation.

1528. OXALIC ACID AND SALT OF SORREL, OR SALT OF LEMONS (page 172), not being so immediately corrosive as the mineral acids, may be removed altogether by the stomach pump, or by an emetic; but it is always better to neutralize the acid by the same means as were before ordered for the mineral acids.

The *Directions* are—1st, to give old mortar powdered, or carbonate of magnesia, or a strong solution of soap, but not carbonate of potass or soda in any dose; and, 2nd, to administer the stomach-pump, if at hand, or to give half an ounce of ipecacuanha or antimonial wine every ten minutes, until vomiting is produced; 3rd, the inflammation of the stomach must be treated as ordered in the last paragraph.

1529. PEARL-ASH (page 172), if taken in large doses, must at once be neutralized by giving about a quarter of a pint of vinegar to each ounce of pearl-ash supposed to be swallowed. Then reduce the inflammation as ordered at par. 1527.

1530. AMMONIA (page 172), if swallowed in solution, should be neutralized by giving vinegar mixed, if possible, with any gummy matter, such as mucilage or starch. Any diluent acid will answer the purpose, such as lemon or tartaric acid, or even diluted mineral acids. The subsequent inflammation is to be treated as before (see par. 1502). *If the vapour is inhaled* in excessive strength or quantity, it produces *bronchial inflammation*, and must be treated as such. (See *Laryngitis* and *Bronchitis*, pages 371 and 372).

1531. ARSENIC (page 172), in whatever shape it is swallowed, should as soon as possible be removed from the stomach, because there are no antidotes which will neutralize its poisonous effects. For this purpose the stomach-pump may be used, if it is in the possession of any of those who are called to the case—that is to say, if they have ability to employ it in a proper manner. If they have not the pump, or cannot use it, an emetic should be at once administered, consisting of one or other of the remedies given at page 349. If either of these plans of treatment clears the stomach in a tolerably short time after the swallowing of the poison, the ill consequences may not be very severe. If inflammation sets in, it must be encountered as advised at page 508; and for the nervous symptoms, which are developed in some cases where death does not take place, time is the best restorative.

The *Directions*, therefore, are to use the stomach-pump or an emetic, and to place no confidence in any antidote.

1532. CORROSIVE SUBLIMATE (page 173) is readily converted into calomel by white of egg, and as the latter substance is not nearly so destructive as the former, the change is a great boon, and if the dose of the poison is not very large, it allows a hope of recovery from its effects. The calomel thus formed will most probably cause a violent attack of diarrhœa, with or without salivation, and this must be expected; indeed, it is better to give a dose of castor-oil to carry it off from the bowels, with the addition of a small quantity of opium, which has a doubly good effect—first, in soothing the irritation produced; and, secondly, in helping to decompose the corrosive sublimate which one of its component parts has the property of effecting.

The *Directions*, therefore, are to give the whites of as many eggs as can be procured and swallowed; and afterwards to administer from half an ounce to an ounce of castor-oil, together with twenty or thirty drops of laudanum. The inflammation is to be subdued as before, and the salivation which probably will follow must be allowed to run itself out.

1533. IF CALOMEL, RED PRECIPITATE, OR VERMILLION (par. 572), happen to be taken, the best thing to be done is to give castor-oil and laudanum, as ordered in the last paragraph.

1534. SUGAR OF LEAD (par. 574), OR CARBONATE OF LEAD (par. 575), OR RED LEAD (par. 576), should be expelled from the system as rapidly as possible; and, if the former is known to have been taken, being a soluble salt, it may be brought up by the stomach-pump, or by an emetic. The carbonate of lead and red lead, are, however, insoluble, and can only be removed by a full dose of castor-oil. If *colic* or *wrist-drop* is produced by small doses of lead often repeated, they should be treated as ordered at page 418 and 463.

Directions.—If the poison is the sugar of lead, or the liquor of the acetate, use the stomach-pump or an emetic; if the carbonate of lead or red lead, give a full dose of castor-oil, which should also be given after the stomach is emptied in the first case.

1535. IF NITRATE OF SILVER (*lunar caustic*) has been swallowed by mistake, give a table-spoonful of common salt, and plenty of warm water, which will both decompose the poison and act as an emetic.

1536. BLUE VITRIOL, OR SULPHATE OF COPPER (par. 577) is in itself an emetic, and will generally cause its own expulsion, with a little assistance, by warm water, and tickling the throat with a feather. Afterwards give white of egg as for corrosive sublimate, and follow this up with a full dose of castor-oil.

Directions.—It acts itself as an emetic, and only requires warm water, after which give white of egg and castor-oil.

1537. VERDIGRIS, BRUNSWICK GREEN, SCHEEL'S, EMERALD, OR MINERAL GREEN (par. 578), should be entangled in white of egg, in which a full dose of an emetic has been previously mixed. After vomiting is produced, give castor-oil.

Directions.—Give white of eggs as above and castor-oil.

1538. TARTAR-EMETIC (par. 579) is also an emetic, and will generally be vomited without injury. Sometimes, however, the symptoms mentioned at page 174 remain behind; and, to render them as little likely as possible, any remaining antimony should be neutralised by some astringent substance, such as yellow bark, or tincture, or infusion of galls. If the sickness still continues, a grain of solid opium may be given and repeated every six hours. The inflammation is to be reduced as ordered at par. 1527.

Directions.—Encourage vomiting by warm water, then give bark in decoction or powder, or galls, in either of these conditions, and, if the sickness continues, opium in grain doses.

1539. CHLORIDE OF ZINC (par. 581) should be diluted with large quantities of warm water, which readily dissolves it if in substance, so as to prevent the corrosive action which is very rapid. The solution is of an emetic nature, and will clear the stomach, so that, if it has not before dilution destroyed the coats, hopes may be entertained of the recovery. After the vomiting, a dose of castor-oil should be administered, and any inflammatory symptoms subdued according to the directions given at par. 1527.

Directions.—Dilute with plenty of warm water, and encourage the vomiting, then give castor-oil.

1540. SAVIN (par. 582) should be removed by an emetic, followed by castor-oil. The irritant effects upon the kidneys should be relieved by constant draughts of barley-water or linseed-tea, and in addition, small doses of laudanum may be administered.

Directions. — Give an emetic, and afterwards castor-oil, followed by liberal draughts of diluents.

1541. SPIRIT OF TURPENTINE (par. 583), OR NITRE, which has nearly the same effect upon the kidneys, should if possible be brought up by an emetic, or by the stomach-pump; after which give castor-oil and twenty or thirty drops of laudanum, and use the diluents as ordered in the last paragraph.

1542. ANY OTHER VEGETABLE IRRITANT may be treated in the same way as turpentine.

1543. CANTHARIDES (par. 584) may be treated in the same way as savin and turpentine (see pars. 1540 and 1541).

1544. FISH AND SHELL-FISH, when they produce the peculiar effect mentioned at par. 585, have generally either been expelled by vomiting, or they are beyond the stomach before they give rise to the symptoms alluded to.

The *Directions*, therefore, will be to give a full dose of castor-oil and laudanum, and if the colicky pains continue, calomel and opium may be administered in grain doses of each

1545. MEAT AND GAME, also, when they disagree, may be treated in the same way (see par. 1544).

SECT. 3.—TREATMENT OF THE EFFECTS OF NARCOTIC POISONS.

1546. PRUSSIC ACID, OR HYDROCYANIC ACID (page 175), OR THE ESSENTIAL OIL OF BITTER ALMONDS (par. 589) may be decomposed by ammonia, and, therefore, this substance should at once be given. A stream of cold water poured upon the head will also have great control over the effects of this poison, and should be used.

The *Directions* are to give a teaspoonful, or rather more, of sal-volatile, and to hold "smelling salts" to the nose, while cold water is poured over the back of the head and down the spine.

1547. OPIUM, when taken either in its crude state, or in any of the preparations mentioned at page 175, should be removed from the stomach by the pump, or by the use of a *strong* emetic, such as the sulphate of zinc, in doses of thirty grains every fifteen minutes, together with the use of warm water in liberal quantities. From the effect of the opium, it is often very difficult to produce vomiting by the emetic, and, therefore, the pump is to be preferred. An excellent aid in producing the vomiting is to compel the patient to turn round and round, which soon causes giddiness, and with this the desired action of the stomach. As soon as the poison is removed, a teaspoonful of sal-volatile in some strong coffee should be administered, and repeated every half hour, and at the same time the patient should be constantly kept awake, either by walking about with an assistant on each side, or by pinching, or pricking with a pin, or by flagellation with a wet towel, or by any other means which may suggest themselves. This must be kept up for at least twelve hours after swallowing the poison, and, indeed, until the patient can keep awake for an hour without rousing, after which the coveted sleep may be permitted.

Directions.—Remove the poison from the stomach by the pump or by a strong emetic; afterwards give ammonia and coffee, and keep the patient awake as directed above.

1548. Woody Nightshade (par. 591) or Henbane must be removed from the stomach in the same way as ordered for opium, and afterwards comparatively gentle measures will generally avert the soporific effects.

1549. Alcohol (par. 592), Ether (par. 593), and Chloroform (par. 594), when swallowed in large doses, must be removed either by the pump or by an emetic, for which last purpose those usually given will suffice. Afterwards the ammonia and coffee, as ordered for opium, may be administered with good effect.

1550. When Chloroform has been inhaled in too large a dose, fresh air should be admitted as rapidly as possible, and the finger should be passed down the throat, and the entrance to the wind-pipe tickled, which will often rouse the muscles of inspiration. If these measures fail, endeavour, while holding the nostrils and pressing upon the left side of the neck close to the wind-pipe, to blow air into the lungs by placing the mouth in apposition with that of the patient, and then press upon the chest to force it out again, repeating the operation until all hope is gone or respiration is re-established. Water should not be dashed in the face on any account, but may be gently flirted or sprinkled against it.

Sect. 4.—Treatment of the Effects of Narcotic Irritant Poisons.

1551. If Nux Vomica, or Strychnine (page 176), should be discovered to have been taken very soon after they are swallowed, a full dose of an emetic should at once be administered, and if it acts promptly the poisonous effects may possibly be averted. A tea-spoonful of sal-volatile may be given in a glass of water after the vomiting has ceased; but there is no known antidote for this poison.

1552. Colchicum and White Hellebore (page 596) produce great exhaustion by purging, as well as directly by depressing the action of the heart.

The *Directions* are that they should be removed by an emetic, followed by a moderate dose of castor-oil, with twenty or thirty drops of laudanum, and if the heart is much depressed, brandy must be administered.

1553. Digitalis (*fox-glove*) (par. 597) is dangerous from its depressing effects upon the heart.

The *Directions* are that it should, if possible, be removed by the stomach-pump if in a soluble form, or by an emetic, followed by a moderate dose of castor-oil, and supporting the powers by sal-volatile and brandy.

1554. Belladonna (*deadly night-shade*), Conium (*hemlock*), Monkshood, and the Seeds of the Laburnum should be expelled by an emetic and purgative, and the depressing effects counteracted by ammonia and brandy.

1555. Poisonous Mushrooms (page 177) must be expelled by emetics, if their presence is discovered within any reasonable time of their having been swallowed. Indeed, in any case, it appears desirable to give an emetic, as they have been known to remain for three days there without passing onwards; afterwards an aperient should be administered, and then the depressing effects must be encountered by brandy, sal-volatile, and perhaps laudanum, if the pain at the pit of the stomach is great.

1556. Poisoning by Yew Berries (par. 603) may be treated in the same way as the articles mentioned at par. 1554.

CHAP. XXV.

TREATMENT OF SUFFOCATION OR ASPHYXIA.

1557. DROWNING becomes fatal by the impediment to respiration which the water presents. The remedies to be applied, therefore, when a person has been immersed for a sufficiently long time to prevent the immediate re-establishment of that process, must be to substitute an artificial respiration in its place. But as this cannot be done on the spot, it is better to remove the body to the nearest shelter, first taking care that there is no mechanical impediment to respiration, such as frothy mucus in the mouth, which, if present, should be wiped away, and at the same time so carrying the chest, that it shall be free to act with the head in a natural position. A hurdle, or a shutter, or a gate is the best thing to carry a body thus found to the nearest house; and when there every article of clothing should be rapidly cut off, and the warmest blankets which can be procured heaped upon the body. Friction with turpentine or hot spirit of any kind may be tried, and the nostrils stimulated with the vapour of ammonia if at hand; but no time should be lost in attempting artificial respiration. The chest may be pressed upon in front, so as to squeeze out the air, and then allowed to expand again, which will effect some trifling change in the contained air; but if there is no surgeon at hand, some bye-stander may at once attempt to inflate the lungs by using the means recommended before at page 277 —viz., blowing into the mouth with the nose held by one hand and the other pressing on the gullet, as it lies by the side of the wind-pipe. These various means may be persevered with for some time, as recovery has been known to take place at the end of several hours. A turpentine enema (page 344) may also be thrown up into the rectum; but beyond these remedies it is not safe for any non-professional person to proceed. If respiration is at all established, and the power of swallowing acquired, and if there is at the same time great weakness of the pulse and of the whole body, a little warm brandy and water should be given, and repeated at short intervals, until the pulse becomes firm and steady, after which nature will generally complete the recovery.

1558. WHEN AN ATTEMPT HAS BEEN MADE TO CAUSE DEATH BY HANGING, of course the first thing to be done is to cut the cord, which should at once be loosened from the neck, together with any other restraint, such as a neck-cloth or collar. Then, if recovery is not immediate, open the temporal artery at once, as directed at page 258, and endeavour to relieve the congestion of the blood on the brain, which the pressure of the cord has produced, as well as the circulation of carbonized blood in it, from the action of the lungs being stopped in the same way. If blood flows freely, in a few seconds an attempt may be made to cause respiration to take place in the same way as directed in the last paragraph; but this is of no use unless relief can be given to the overloaded brain by bleeding from some vessel in the head.

1559. CHOKING, from having swallowed some article which is too large to pass into the stomach, is not often attended with the immediate danger which might be supposed from the spasms which are produced. The best ordinary remedy is a smart slap on the back, not too heavy, and this, with the swallowing of some soft food, washed down with a little water, will often dislodge the lumps or bone, which is causing the obstruction. If a fish-bone has stuck in the upper-part of the throat, the finger carried back over the tongue will sometimes be able to hook it out, or it will cause such a degree of straining as to bring it up by vomiting. If these remedies fail there is nothing to be done but to use the long thin piece of whalebone with a sponge at the end, which is called a *probang*, and which must be oiled, and then passed down the gullet with the intention of pushing the substance into the stomach. This operation, however, should never be attempted by any unprofessional person excepting in any great emergency, and in the absence of surgical aid.

1560. **If Suffocation has been caused by Carbonic Acid Gas**, as in a brewer's vat, or in a well, or from a stove, the method of recovery is the same as in the case of a person who has been immersed in water (see par. 1557).

1361. **A cut Throat** may cause suffocation from the wind-pipe being divided, and the blood lodging in it. Usually, however, death takes place from loss of blood. If such an injury is brought under the care of an unprofessional person, he must proceed to stop the bleeding, if possble, by tying the arteries, which are divided, in the mode ordered at page 395; but if any long vessel is wounded, death is generally instantaneous. If the wind-pipe is divided, the wound should not be closed until the bleeding has entirely ceased; and it is better to keep it open for three or four hours, so that there may be no chance of blood passing into it. At the end of that time the wound may be stitched up, as directed at page 396, and if the chin is constantly bent down upon the chest, it is possible that union may be effected. If the arteries have been tied, the ligatures are to be brought out at the lower corners of the wound, and treated according to the directions given at the same page.

CHAP. XXVI.

MANAGEMENT OF THE DISORDERS INCIDENTAL TO SEA-VOYAGES.

1562. **Sea-sickness** is the bane of most of those who cross the sea, and though its effects do not generally continue for more than a few days, yet with some people it appears to be a perpetual torment. Certainly it has lasted for months together in many instances, but whether it would positively be incessant, it is impossible to say, for there are few who would try the experiment beyond the voyage which they are compelled to finish. The motion of the ship appears to be the cause of the sickness, and a swing will have the same effect, as has been proved in lunatic asylums when it has been used as a punishment for refractory patients. The best method of relieving this kind of sickness is either to brave it out, and be sick again and again, eating as usual, regardless of the subsequent rejection of the food; *or* else to lie quite still on a sofa, well supported by cushions so as to prevent the necessity for those instinctive efforts which are made to counteract the rolling of the ship. By this latter plan, many can succeed in warding off the sensation; but the misfortune is, that even if an individual is not himself sick, some one else is sure to be, and then the consequence is sure to be fatal to his own peace of stomach. Creasote with some people, or capsicum with others, will afford relief, while others again find comfort in soda-water and brandy; but I believe there is no remedy which will give relief in those instances where the nervous system seems incapable of rallying against the depression produced. The following may be tried by those who require something of the kind:—

Take of Creasote, min. iv.
Powdered ginger, gr. iv.
Extract of henbane, gr. viij.

Mix, and divide into four pills. One

to be taken when the sickness comes on;

Or, take of—

Powdered capsicum, gr. viij.
Extract of hop, gr. xij.

Mix, and divide into four pills. One to be taken when the sickness is troublesome;

Or, take of—

Chloral hydrate, gr. v. to viij.
Sal-volatile, min. xxx.
Water, ℥j.

Mix, and take about half an hour before leaving harbour.

1563. CONSTIPATION appears to be produced by the same cause as the sickness, whatever that may be, for we find in the majority of cases that the bowels do not act at sea, apparently from the usual peristaltic action of the bowels being reversed, as is the case with the muscular contraction of the stomach. The best plan is never to allow the bowels to be confined a single day on first commencing a voyage, and this plan will also materially serve to prevent the sickness. Seidlitz powders, *if taken early*, and before the constipation is confirmed, will often act most beneficially; and if so, one may be taken every morning, or half a powder will be sufficient for most people. If aperient medicines will not keep down, an enema composed of a large quantity of water, with an ounce of Epsom salts dissolved in it, will often restore the proper action of the bowels; and they may in many cases be made to act regularly only by this remedy, when the stomach is seriously upset. The *diet* at sea is composed of very dry and astringent food, which also adds to the constipation, and for this reason, in addition to the one given above, the constant and repeated use of aperients will be beneficial. If the voyager has been accustomed to any kind of regular aperient, he had better continue it in increased doses, for the stomach will often tolerate drugs which it has been accustomed to, when it will refuse fresh ones. If Epsom salts are taken, they must be combined with some essential oil, such as peppermint, or they will cause spasm, instead of acting in their accustomed manner; but, with the addition of a few drops of the oil of peppermint, they form a very useful aperient on a voyage.

1564. DYSPEPSIA often arises at sea from the want of exercise which is felt, and from the overloading the stomach with food out of all proportion to the wants of the system. If the passengers would only make up their minds to walk the deck for a certain time every day, and to eat less than their usual meals, instead of more, there would be no cause to complain, as there now is, that the stomach is sure to get out of order in a sea voyage.

1565. THE GREAT PREVENTIVES OF DISEASE ON BOARD SHIP are *regular exercise on deck*, *attention to the bowels*, and *a diminished allowance of food*. On the other hand, those who obstinately keep their berths, and allow their bowels to become loaded and stagnant, or those who swallow most improper articles of food, and also very much, too frequently have only themselves to thank if they never feel well.

Where figures only are given, they refer to the respective pages.
Paragraphs are indicated thus—(par. 123).

PART III.

GLOSSARY AND INDEX,

With the Treatment of such Trivial Diseases and Accidents as are not included in the previous Parts.

ABDOMEN, or *Belly.*—The large central cavity of the body, bounded above by the chest, below by the pelvis, behind by the bones and muscles of the back, ribs, loins, and hip, and in front by the abdominal muscles. The separation from the chest is effected by a thin muscle, called the *diaphragm*, which being in an arched form with the convexity upwards, has the power of enlarging the capacity of the chest by its contractions; in doing which it pushes downward the abdominal organs, and hence we have the front of the abdomen becoming more prominent at each descent of the diaphragm, which corresponds with inspiration; while during its relaxation the abdominal muscles contract, and drive the organs of that part up into the chest, carrying the diaphragm before them. The division from the pelvis is imaginary, and the organs contained in this cavity often rise into the abdomen, when they are enlarged, as, for instance, the uterus and bladder. The line is placed at the level of what is called the upper aperture of the pelvis, being marked by an angle at the sides and back, where the bones spread out into the wings of the ileum. The organs contained within the abdomen, and commencing above, are the liver on the right side, and the stomach on the left; then a semicircle of large intestine which commences in the right groin and rises to the level of the liver and stomach, after which it descends to the left groin and passes into the pelvis; thirdly, an assemblage of small intestines which are folded irregularly in front of the space which is encircled by the large intestine; and fourthly, the spleen and pancreas close to the stomach, and the kidney on each side—one below the stomach, and the other below the liver. These various organs are supplied with their blood by arteries from the aorta as it passes down to the lower limbs, and return their blood by numerous veins which end in the principal vein of the liver (the *vena portæ*). They are also more or less enclosed in folds of a serous membrane (see par. 231) which is called the *peritoneum*, and which may be compared to a large bag laid in front of them, but so arranged that its posterior half shall partially envelop the organs which it comes in contact with, whilst the anterior half lines the muscles; so that, if the abdomen is opened in front, the knife, in dividing these muscles, cuts through the front of this bag; and before wounding any of the organs, it must necessarily cut through the back of it. The abdomen is divided into nine regions—three above, (the *right hypochondriac*, *epigastric*, and *left hypochondriac*); three in the middle, (the *right iliac*, *umbilical*, and *left iliac*); and three below, (the *right inguinal, hypogastric*, and *left inguinal*).

ABDOMEN, Distended.—A *symptom* of *dropsy*, if attended with fluctuation; of *flatulence* or *tympanites*, if attended with a drum-like sound on percussion; and of *constipation*, or *organic disease* of the viscera contained within it, if a sensation of solidity is communicated to the hand. When the lowest part of the abdomen only is enlarged, it may be owing to a *distended bladder* from retention of urine, or in the female it may be due to *pregnancy*, or to *amenorrhœa*, or to *ovarian dropsy*. (See *each of the above subjects*.)

ABDOMEN, Examination of the.—By the practised physician this part of the body is very carefully explored, in order to ascertain whether there is any enlargement of the organs, which may be either temporary or permanent; and also with the view of discovering the presence of fluid in the cavity, which constitutes the disease known as *ascites* (*par.* 253). Slight and trivial alterations are beyond the skill of the ordinary observer; but he should be able to discover any serious enlargement, such as is presented in many diseases of the liver, or in the disease of the mesenteric glands known as *atrophy*. In examining the abdomen, the patient should be placed on the back with the muscles relaxed, and then by carrying the fingers over the surface with a gentle pressure, any irregularity may be detected. If there is a swelling and unnatural hardness in the right hypochondriac region, it may be suspected that the liver is affected, being either simply congested or permanently and organically diseased. When there is a swelling in the course of the large intestine, it is most probably due to a collection of *fæces* which a dose of aperient medicine will get rid of. A hard and painful swelling at the epigastrium (pit of the stomach) may lead to the suspicion of organic disease of the stomach, probably of a cancerous nature, while a soft, elastic, and drum-like enlargement merely indicates the presence of wind. If the whole abdomen is swollen and tense, and on tapping gently with the fingers sounds like a drum, it is said to be *tympanitic*, a condition which accompanies fevers and some other severe diseases. If, on the other hand, the swollen and prominent abdomen does not sound in this way, but trembles or "fluctuates" when it is tapped with one hand while the other is held against the opposite side, fluid may be suspected to exist within the *peritoneum*. An enlargement gradually increasing for weeks and months, and commencing from either inguinal region in the female, and not in the middle line, may be set down as probably an *ovarian dropsy*. See 495.

ABDOMEN, Pendulous, treatment of after parturition, 497.

ABDOMEN, Tenderness on pressure of the.—A symptom of inflammation of some of the organs within its cavity, varying with the part affected. If it is general, *peritonitis* may be suspected; or, if local, the *liver*, or *stomach*, or a portion of the *bowels*, or the *womb*, or the *bladder*, may be inflamed. See *Peritonitis*, 82; *Enteritis*, 84; *Gastritis*, 52; *Hepatitis*, 99; and *Inflammation of the Womb and Bladder*, 56.

ABORTION, Symptoms of, 168; prevention of, 496.

ABRASION is a bruise in which the scarf skin is removed, and which may be best treated, either by leaving it to nature, or by the use of the water-dressing. See 397 (*par.* 1250).

ABSCESS.—A collection of matter within the parts beneath the skin, as one of the results of inflammation. See 75, 94, 367.

ABSCESS, Symptoms of *psoas* and *lumbar*, 139; after erysipelas, 383.

ABSCESS, Treatment of, in infants, 279; in the adult, 405 (*par.* 1272); in the bones, 430; in the breast, 504.

ABSORBENTS and absorbent glands. These are certain minute and delicate vessels scattered throughout the body, which have the peculiar property of taking up, or selecting the particles which are in a condition either to be taken into, or removed from, the body. They run nearly a straight course towards the heart, passing through small glands, which are situated in the abdomen, groin, armpit, and neck, and called the *absorbent glands*. The ABSORBENTS are divided by anatomists into two sets—1st, the *lacteal absorbents*, and 2nd, the *lymphatic absorbents*.

(*a*) *The lacteal absorbents* commence on the surface of the intestines by minute branches, and soon coalescing, they unite into larger vessels, which enter the "mesenteric glands;" and after passing through these, they discharge their contents into a little bag (the *receptaculum chyli*), which is placed in front of the second vertebra of the loins. From this bag, which also receives the contents of some of the lymphatic absorbents, a vessel called the *thoracic duct* carries on the contents into the large veins as they are passing into the heart, the exact point of entry being at the junction of the left subclavian and jugular veins.

(*b*) *The lymphatic absorbents* commence in all parts of the body, and after passing through various glands, they terminate either in the *receptaculum chyli* (see *a*), or in the thoracic duct, or in the veins near the entrance of this duct.

ABSORBENTS. Symptoms of inflammation of the, 110; treatment of inflammation of the, 455.

ABSORPTION is the process by which various matters are taken into, or removed from, the body. It is carried on partly by the absorbents (which see), and partly by the veins which share with them the power in question. Various explanations are offered by physiologists of the precise mode by which absorption is effected; but little is known with certainty of it. It is generally supposed that the action is similar to that which is known to prevail in dead membranes, and is called *endosmose* and *exosmose* (which see).

ABSTINENCE, the excessive or total privation of food, which may be either *curative*, or *diseased*, or *involuntary*.

(*a*) *Abstinence from food* as a means of cure enters into most of the plans of treatment for acute diseases, in which its object is to cut off the supplies. See *Diet in Inflammation, &c.*

(*b*) *Abstinence* from a diseased condition of the mind is common in *mania*, and produces the same degree of emaciation and debility as if it occurred from necessity. Sometimes abstinence is attempted in prison, in order to produce suicide; but it is seldom carried out to that extent, since the natural appetite for food prevails over the desire for death, when a good meal is offered to the palate. In any case death is prevented by the use of the stomach-pump, which can convey liquid food down the gullet, in spite of the resistance of the most obstinate patient.

(*c*) *Involuntary abstinence* may be either from famine, or from shipwreck, or other accidents at sea, or from contraction of the gullet, which mechanically prevents the swallowing of food.

(*d*) *In the treatment of abstinence*, when the cause is removed, great care is required to avoid overloading the stomach. Very small quantities of food must at first be given, and at short intervals, gradually increasing the extent of each as the strength returns.

ACACIA, Gum, 222; mixture of, 238.

ACARI, certain parasitic animals infecting man. See *Scabies*, 64.

ACETATE OF POTASS, 241.

ACETIC ACID, 222; diluted, *ib.*

ACID, Definition of, 222; acetic, *ib.*; diluted acetic, *ib.*; carbolic, *ib.*; citric, 223; gallic, *ib.*; hydrochloric, *ib.*; diluted hydrochloric, *ib.*; diluted hydrocyanic, *ib.*; nitric, *ib.*; diluted nitric, *ib.*; sulphuric, 224; diluted sulphuric, *ib.*; tartaric, *ib.*

ACIDS, Symptoms of poisoning by, 171, 172; treatment of poisoning by, 507, 508.

ACNE, Symptoms of, 66; treatment of, 386.

ACONITE, or *Monkshood*, Symptoms of poisoning by, 177; treatment of poisoning by, 511.

ACUPUNCTURE.—A curative operation, which is performed by pushing into the body a needle (fixed in a handle) with a quick-rotatory motion. It is intended to relieve neuralgia and chronic rheumatism; but it is not much employed at present in the treatment of these diseases.

ACUTE.—This word is constantly used in medicine to signify a more violent and rapid progress of disease, than that known as *chronic*, and between the two extremes, there is also an intermediate stage, which is sometimes called *sub-acute*.

ADHESION, in disease, is the union of adjacent parts by the process of inflammation, 42 (*par.* 123), 367 (*par* 1183 *a*).

ADHESION, in surgery, 42 (*par.* 124), 395 (*par.* 1246).

ADIPOSE.—Fatty.

ADVICE, Medical.—Throughout this volume, the necessity for resorting to good medical advice, in the early stages of disease, has been constantly insisted on; and it is not with a view to supersede it, that the various directions for treating diseases have been given with minuteness; but simply because it is practically felt in some cases that medical aid is not always to be obtained, as in the case of the absolute pauper, or in that of the apparently richer man, but who, by the artificial wants of society, is rendered so poor that he is incapable of remunerating a practitioner in whom he can place confidence. But whatever may be the cause, it is notorious that a great many individuals are induced to resort to druggists throughout Great Britain for advice; and perhaps they are quite as well served by these gentlemen as by the lowest class of the qualified practitioners of medicine, who are sometimes quite ignorant of the elements of medicine until they commence practice, and are, therefore, quite on a level in point of education with the druggist. To those, therefore, in this country who are induced or compelled to dispense with the advice of a scientific practitioner, and to those abroad who have no choice, these remarks are applied; while to those who very properly place themselves under such a person as they ought to trust, I should strongly advise a complete submission to his directions, without the slightest attempt to dispute them, or to understand the principles upon which they are given, beyond any explanation which he himself may afford.

AERATION of the Blood.—The process by which the blood is deprived of its superfluous carbon, and supplied with fresh oxygen. This is effected in the lungs, where the blood in its minute vessels is only divided from the air by a very thin membrane through which these gases must pass. See *Respiration* and *Circulation*.

ÆTHER.—See *Ether*, 224.

AFFUSION, Cold.—The pouring of cold water over the body, as practised in scarlet, and other fevers. See *Hydropathy*.

AFTER-BIRTH, 499.

AFTER-PAINS, 499.

AGE. — Every species of organized beings has a certain definite period of existence allotted to it, which varies slightly among the individual members, but in the aggregate is nearly uniform. Hence every animal, and among them man himself, has an "age" given to him, which he cannot exceed, and at the end of it his machinery is worn out, and he dies. The same thing happens in machinery made by his own hand; and it is asserted that there are individuals among the railway officials who can assign almost the exact number of miles which each locomotive will be able to run, after examining the quality of its materials and workmanship. Man's life is usually divided into the periods of *infancy*, *childhood*, the *adult* age, *middle* age, and *old* age. Each of these has its peculiar diseases, and requires particular management in point of *warmth*, *food*, and *exercise*. The diseases and management of *infancy* and *childhood*, occupy the Second Book of Part II., while those incidental to the *adult* age are treated in the Third Book of the same Part. In *middle* age, they may be said to resemble those of the adult so closely as to require no difference of treatment; but, in *old* age, the remedies employed must be of considerably less power, and bleeding and purging are very ill borne. Most of the complaints peculiar to this period of life are included in Book III., such as senile bronchitis, senile prurigo, &c., and it is unnecessary to allude to them here. The quantity of exercise, food, and sleep required, and usually taken, in old age, is considerably less than in former years, and goes on gradually diminishing till near the termination of existence, when a perpetual doze is sometimes kept up, but without sound sleep. The power of generating heat is very small, and the body should, therefore, be well clothed in flannel next the skin, and covered with plenty of warm blankets at night. As the teeth in very aged persons are usually gone, unless a good set of "artificials" is supplied, mastication is very imperfectly performed; and for this reason the food should be supplied in a finely divided condition—that is, either minced or potted, and milk-puddings or savoury soups will afford more nourishment than any thing else. Stimulants of some kind are absolutely essential to those who have been accustomed to them during the early part of their lives, and a moderate allowance of beer or wine should in such cases be always allowed.

AGE, Influence of no disease, 3.

AGES, Tables of proportional doses for various, 222.

AGUE, Symptoms of, 27; causes of, 28; treatment of, 356.

AGUE-CAKE.—A popular name for the enlargement of the spleen, which often accompanies ague, 102.

AIR, Atmospheric.—The space in which we breathe is occupied by a gas composed of nitrogen and oxygen in certain definite proportions, under all circumstances the same, whether in the crowded parts of London or by the open sea-shore. But mixed with these constant elements there are others which cannot be so easily measured, and which evidently vary greatly, such as the amount of moisture, of carbonic acid gas, and of ammonia, besides other elements of mischief which are only known by their effects upon man, and which are, therefore, named *malaria*. The following is the composition as generally admitted by modern chemists calculated by measure:—

Nitrogen	79·19
Oxygen	20·81
	100·

Carbonic acid, from 3·7 to 6·2 measures in 10,000 measures of air.

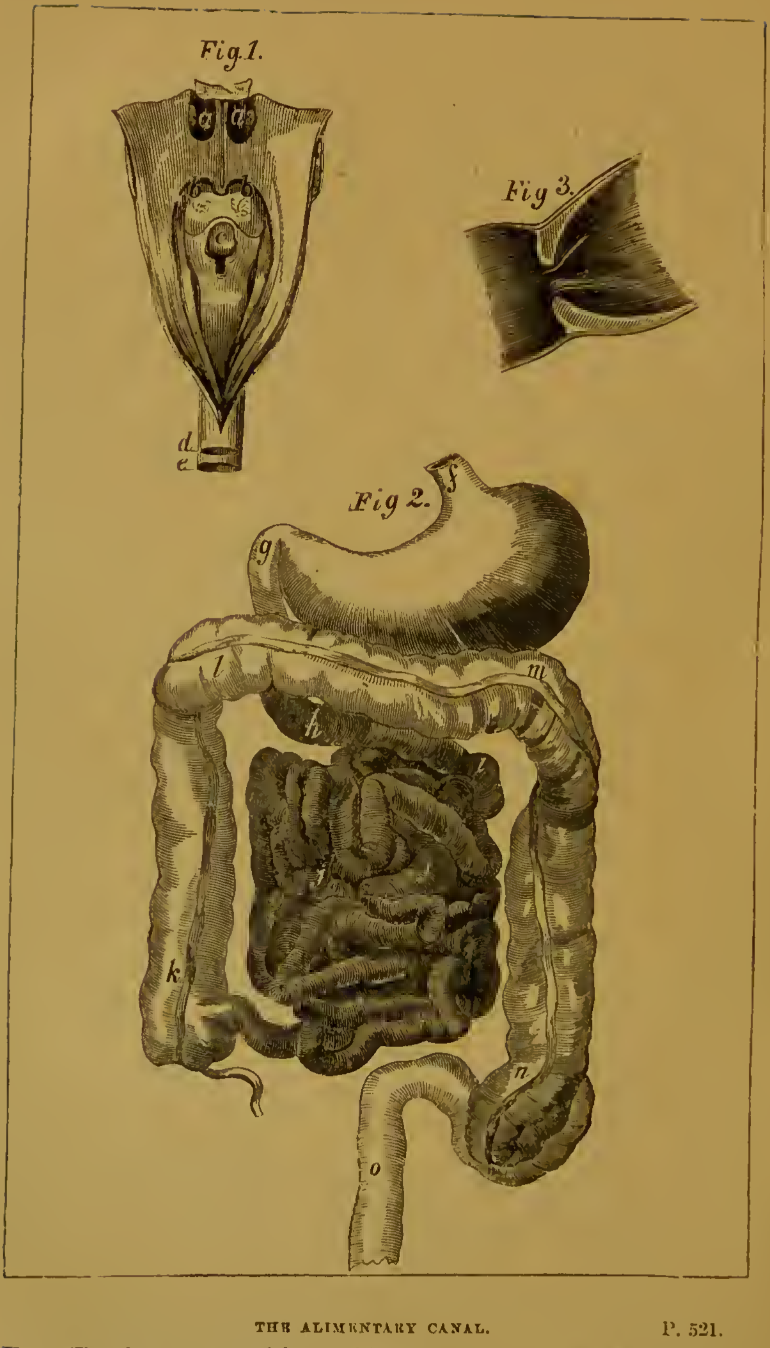
Aqueous vapour, exceedingly variable.

Ammonia, merely a trace.

When air is inspired by a number of people in a close room, the quantity of carbonic acid gas is rapidly augmented, being the residuum of respiration.

AIR, Change of.—This is a popular and most valuable remedy in the cure of many diseases, especially those of a chronic nature, and also in the convalescence from acute disease. Those who are confined to sedentary occupations in towns and cities are especially benefited by change of air, if it is made to that of the country. By the term here used, we do not generally mean change of climate, but simply the removal to a different kind of air to be met with in the same country, but in a different locality. Thus the removal from London to the hills of Middlesex or Surrey often affords quite sufficient change to effect a cure, though of course it is still more powerful if the change is made to Brighton or Scarborough. In selecting a good and useful change, the choice will mainly depend upon the nature of the disease, and of the constitution, as well as of the locality where these were developed; and it is to the indiscriminate manner in which "change of air" is recommended that so much disappointment is due, when it fails to have the desired effect. Thus, the feeble and irritable invalid will not benefit by a keen and bracing air, whatever may be the nature of his disease; while another with the same disease, but with a lymphatic temperament, will feel the change a relief before he has breathed the air for an hour. This is constantly exemplified in bronchitis, as well as in consumption itself, and is also true of most disorders which affect the nervous system. Next in importance to the bracing or relaxing nature of the air, is the question as to the choice of that at the coast or in the interior, and here the season of the year will form an important element in the discussion. With the exception, perhaps, of Ventnor, and one or two spots on the Devonshire coast, there are no situations at the sea-side warm enough for delicate invalids (and especially for those suffering from any affection of the lungs), during the winter and spring, and very few which are fit to be selected until midsummer is passed; while, after that time and in the autumn they are to be preferred in most cases, as being more free from vegetation than inland situations, and therefore not exposed to the influence of malaria. Of course this does not apply to residents at the sea-side, who often require a change to the interior as a remedy, which will prove quite as beneficial to them as the contrary does to the inhabitants of inland cities, or of thickly-wooded and relaxing rural districts. As a rule, therefore, it may be laid down that, when change of air is required on account of the deleterious nature of that which is to be left, the change should be made, as far as possible, to its opposite—that is to say, if the patient has been living in a town, then let him go to the country, selecting the sea-side or the interior, according to his wishes, and to the season of the year, and being guided in the choice of a bracing or relaxing situation, by the previous effects of either if known, or if not by the character of his temperament. But, if the change is to be made, merely as a change, and because of some disease which is not dependent upon impure air, but is expected to be benefited by a different one, then the selection must be made according to the season of the year, and to circumstances which will materially benefit health—such as amusement and occupation of the body and mind. These last items are of more importance in change of air than is generally supposed; and I am persuaded that comparatively no good is derived from a disagreeable spot, let the air be ever so pure; while a more impure atmosphere will effect a greater change if the individual is pleased and amused during his stay. It must also be remembered that it is universally admitted that a constant change does more good than remaining in one place, and this most probably depends upon the above necessity for occupation and amusement. Children, no doubt, can be made happy enough, day after day, for months together, by searching for shells and sea-weed on the sands; but grown persons soon tire of those and other similar playthings, and nothing short of incessant moving from place to place will satisfy them. In the choice of the particular lodging or other residence during a change, an especial examination should be made as to the *drainage*, *dryness* of the walls, and *fittings* of the windows, when the case is one of great delicacy, as it often happens that at the sea-side all these points are very defective, and occasionally the whole of the house-drainage is permitted to flow down the beach without any covering, and sometimes without even a drain being cut to receive it. See *Climate*.

AIR, Supply of, necessary to health, 8; fresh, importance of, for children, 285.



THE ALIMENTARY CANAL. P. 521.

Fig. 1. The pharynx opened from behind. *a a* the posterior nares; *b b* the arches of the palate; *c* the glottis.

" 2. *f g* the stomach; *g h* the duodenum; *h i* the jejunum; *j j* the ileum; *k* the cæcum; *k l* the ascending, *l m* the transverse, *m n* the descending, colon; *n* the sigmoid flexure; *o* the rectum.

" 3. The pylorus.

ALBUMEN, one of the chief component parts of the human body, especially of the blood. White of egg is a familiar example of this substance, being composed of nearly pure albumen and water. When any solution of albumen is heated, or mixed with nitric acid in sufficient quantity, it coagulates or curdles, and is then insoluble in water. The chemical composition of albumen is as follows:—

Carbon	53·5
Hydrogen	7·0
Nitrogen	15·5
Oxygen	22·0
Phosphorus	0·4
Sulphur	1·6
	100·0

It is from the presence of the sulphur in the egg that the silver-spoon is blackened with which a boiled egg is eaten.

ALCOHOL.—The base of all liquors which have undergone the vinous fermentation, without going on to the acetic. In a natural state it is always mixed with water and flavouring matters, &c.; and it is only by distillation and subsequent mixture with quick-lime, which absorbs the water, that absolute or pure alcohol can be obtained. It is composed of carbon, hydrogen, and oxygen in definite proportions, and its specific gravity at 60° F. is 0·7938. The proof spirit, which is that usually sold as alcohol, has a specific gravity of 0·9198 at 60°, and contains 49¼ per cent. of pure alcohol.

ALCOHOL, Symptoms of poisoning by, 176; treatment of poisoning by, 511.

ALE.—See *Malt Liquors.*

ALIMENT.—Any article capable of nourishing the body. See 13, 14, 15, 16, 17, 189.

ALIMENTARY CANAL—The tube which reaches from the mouth to the *anus*, and which conveys the food from one to the other of these orifices, has received the name of the alimentary canal, and averages six times the length of the body. It commences with the mouth, where the food is masticated and mixed with saliva, from this it gradualy contracts at the back of the throat in a funnel-shaped form (the *pharynx*), until it becomes a narrow muscular tube (the *œsophagus* or *gullet*). This gullet enters the upper part of the *stomach*, near its middle, and the canal in passing out of that organ again contracts to a smaller size to form the first of the small intestines, called the *duodenum*, between which and the stomach is a muscular opening (the *pylorus*). Next to the *duodenum* comes the *jejunum*, and then the *ileum*, the three being arbitrary divisions of the small intestines. But at the bottom of the left iliac region, the ileum suddenly ceases, and communicates with a much larger intestine (the *cæcum*) by a narrow slit guarded by two valves, where solid substances are very apt to lodge. From this part the large intestine (afterwards called the *colon*) ascends to the under side of the liver, where it crosses over beneath the stomach to the other side, and then descends to the left iliac region, where it passes into the pelvis with a considerable curve (called the *sigmoid flexure*, from its resemblance to the Greek S), and becomes the *rectum*. The three several portions of the colon mentioned above are denominated *ascending*, *transverse*, and *descending*. Throughout the greater part of this canal it is composed of three distinct coats united together by cellular membrane, and known as—the *mucous coat* or *membrane*, lining it throughout; the *muscular coat*, also existing all through its course; and the *peritoneal coat*, which covers the greater part of the stomach and of the small and large intestines, except part of the *duodenum*, which lies behind it. (See *Mucous Membrane*, 45, and *Peritoneum*, 81.) In the whole of the canal, the muscular coat is partly composed of circular, and partly of longitudinal, fibres, which by their successive contractions produce the action called *peristaltic*, by which the food is

propelled. But in the large intestines, the latter fibres are gathered into three distinct bands, and these pucker up the bowel, as it were, into cells, in which the fæces are very apt to lodge. See *Constipation*, 157.

ALKALI.—The metals *potassium* and *sodium*, when united with oxygen, constitute the alkalies *potass* and *soda*, which are capable of still further uniting with the various acids to form certain salts, such as the *carbonates*, *sulphates*, &c., of soda and potass. *Ammonia*, which is composed of the gases *nitrogen* and *hydrogen* alone, is also capable of uniting as a base in the same way, and is called a *volatile alkali*, because it is readily made to pass into a gaseous condition.

ALLOPATHISTS, their principles of treatment, 182, 191.

ALMONDS, Sweet.—The kernels of the almond-tree fruit, imported from Spain, Italy, and Barbary. When scalded and blanched, they are used in medicine for making an *emulsion*, by beating them in a mortar with white sugar, powdered gum-arabic, and water, 225.

ALMONDS, Oil of, 225; confection of, 230; mixture of, 238.

ALMONDS, Bitter, symptoms of poisoning by the essential oil of, 175; treatment of poisoning by the same, 510.

ALOPECIA.—Baldness, Symptoms of, 73; treatment of, 391; in children, 309.

ALOES, Barbadoes, 224; hepatic, *ib.*; socotrine, *ib.*; compound pill of, 240; pill of, with myrrh, *ib.*; decoction of, 232.

ALTERATIVES.—A class of medicines which are supposed to produce a new action, 187.

ALUM. — A compound of sulphuric acid, alumina, and potassa, 224.

ALVEOLUS.—The socket of a tooth, forming part of each jaw.

ALVINE.—Of or belonging to the abdomen.

AMAUROSIS, Symptoms of, 163; treatment of, 490.

AMENORRHŒA, Symptoms of, 168; treatment of, 493.

AMMONIA.—A compound of hydrogen and nitrogen. See *Alkali*.

AMMONIA, Sesquicarbonate of, 225; liquor of, *ib.*; aromatic spirit of, 243; muriate of, *ib.*; liniment of, 236; acetate of, 237; fetid spirit of, 244; symptoms of poisoning by, 172; treatment of poisoning by, 508.

AMMONIACUM, Gum, 225; mixture of, 238.

AMPUTATION.—The operation by which a portion of the body is cut off by the knife; but being beyond the powers of domestic surgery, the details are here excluded. If a limb is removed by *accident*, it must be treated according to the principles laid down for *Wounds*, 397.

ANŒMIA, Symptoms and causes of, 132; treatment of, 467; treatment of, in children, 322.

ANŒSTHESIA.—The loss of sensation either from disease or by the application of certain articles which have the power of producing it, such as ether and chloroform when inhaled, or ice when locally applied.

ANALYSIS.—In chemistry the method of separating and detecting the parts of a compound substance.

ANASARCA.—Dropsy, or effusion of water into the cellular membrane of the surface of the body, 74 (*pars.* 221, 222). It is a symptom of diseased liver, kidneys, or heart, and is one of the sequels of scarlatina.

ANCHYLOSIS.—The union of two separate bones, by fresh bony matter being thrown out between them, 94.

ANEURISM, Symptoms of, 141; situation of, *ib.*; treatment of, 473.

ANEURISM, Varicose, Symptoms of, 141.

ANEURISMAL VARIX, Symptoms of, 141.

ANEURISM BY ANASTOMOSIS, Symptoms of, 141; treatment of, 473.

ANGINA PECTORIS, Symptoms of, 144; treatment of, 476.

ANI PROCIDENTIA. — A falling down or protrusion of the lining membrane of the anus, 54 (*par.* 160).

ANIMATION, Suspended.—A term used synonymously with *suspended respiration*, *asphyxia*, and *suffocation*, 277, 512.

ANISEED, Oil of, 225.

ANKLE-JOINT.—The joint between the leg and the foot. It is composed of the tibia and fibula above, and of the astragalus below. These are firmly united together by strong ligamentous bands, which also are attached to other bones of the instep or *tarsus*, and which are injured or ruptured in sprains and dislocations.

ANKLE-JOINT, Varieties of dislocation of, and their treatment, 424.

ANODYNE. — Soothing, narcotic, 190, 344.

ANTHELMINTHICS.—Worm medicines, 330, 331.

ANTI-ACIDS, 343.

ANTI-ARTHRITICS, 343.

ANTICONVULSIVES, 343.

ANTIMONY.—A metal which is the base of tartar-emetic, antimonial powder, &c.

ANTIMONY, Potassio-tartrate of, or *tartar-emetic*, 225, 226; powder of, 242.

ANTIMONIAL WINE.—See *Wine of Potassio-tartrate of Antimony*, 246.

ANTIPERIODICS, having the property of relieving periodic diseases, 343.

ANTIPHLOGISTIC, having the property of reducing inflammation, 342.

ANTISEPTIC, having the property of retarding putrefaction.

ANTISPASMODIC, having the property of relieving spasm, 343.

ANTISCROFULICS, 343.

ANTISQUAMICS.—Those medicines which have a specific effect on scaly diseases of the skin, 343.

ANUS.—The fundament, or lower opening of the alimentary canal. See *Alimentary Canal.*

ANUS, Sphincter of the.—A muscle which surrounds the opening, and has the power of closing it. This power is kept up instinctively in a state of health, but is lost in certain diseases, such as paralysis, and the last stages of fever, &c.

ANUS, Treatment of prolapse of, 428.

ANUS, Itching of the.—A symptom of worms, 158.

ANUS, Fistula of the.—A complaint in which there is an unnatural opening leading into the bowel by the side of the anus. It shows itself by the discharge of matter from a very small opening, and is beyond domestic treatment, except as far as palliatives are concerned, the best of which is cleanliness, with the free use of warm water. See *Fistula.*

AORTA.—The principal artery of the body, which commences from the heart, where it is guarded by three strong valves, and rising in the form of an arch, descends along the backbone to the loins, where it divides into the two iliac arteries, to supply the lower limbs. In this course it gives off the carotid arteries to the head, the subclavian to the arms, the intercostals to the sides of the chest, and the various arteries to supply the contents of the abdomen.

AORTA, Aneurism of the, 141

APERIENT. — Opening, cathartic, 191, 346.

APERIENTS, Infantile, 268, 269.

APHONIA.—Loss of voice. See *Laryngitis*, 48.

APHONIA CLERICORUM. — See *Clergyman's Sore-throat.*

APHTHA.—Thrush, 336.

APOPLEXY, Symptoms of, 118; treatment of, 460; pulmonary, symptoms of, 76.

APOTHECARIES' English weights, 220; French weights, *ib.*; English measures, *ib.*; French measures, *ib.*; utensils, 221.

APPETITE.—The instinctive desire to gratify the natural wants of the system by the supply of food to the stomach. See *Hunger*, 155.

APPETITE, Depraved.—A symptom of chlorosis, 132; of pregnancy and worms, 158.

APPETITE, Loss of.—A symptom of fever, 23, 40; congestion of the liver, 99; dyspepsia, 153; constipation, 157; and general *malaise.*

APPLE-WATER, receipt for making, 250.

AQUA PURA.—Spring-water.

AQUA DISTILLATA. — Distilled water.

AQUA FORTIS.—Nitric acid, 223.

AQUA REGIA.—Nitric and muriatic acids mixed in equal proportions by measure.

AREOLA.—The inflamed circle which surrounds a vesicle or pustule on the skin. It is specially applied to that which shows itself round the cow-pox vesicle, 35; also to the circle which is developed round the nipple in pregnancy (which see).

ARM-PIT.—The hollow space beneath the shoulder, by anatomists called *axilla*.

ARNICA MONTANA (*Leopard's bane*).—The leaves, either fresh or dried, are used externally to bruises.

ARNICA, Tincture of.—When mixed with water, this forms an admirable external application in bruises, strains, &c., 418.

AROMATICS.—Warm vegetable stimulants.

AROMATIC CONFECTION, 230.

ARROWROOT.—A species of starch, obtained from the roots of several plants; that from the *maranta arundinacea* is considered the best, and is generally sold as maranta or West India arrowroot, or sometimes as Bermuda or Jamaica arrowroot. The arrowroot obtained from *tacca oceanica*, and from the *manihot* and *curcuma*, as well as the produce of our own potato, are vastly inferior to the real *maranta*, by which name the arrowroot from that plant ought to be designated, for the sake of distinction. *Maránta arrowroot* is almost entirely composed of starch-granules. To the eye it should be of a dull flake-white, crackling under the pressure of the finger; *and when double its weight of concentrated hydrochloric acid is poured upon it, it should become an opaque paste.* By the addition of a pint of boiling water to a table-spoonful of arrowroot previously mixed with a little cold water, it makes a transparent jelly, which becomes thinner in the course of twenty-four hours, the good quality of the arrowroot being indicated by the time which it occupies in getting thin. Potato arrowroot, as well as some other inferior kinds, when mixed with a similar quantity of hydrochloric acid to that mentioned above, form a *clear* and *transparent* paste, by which they may be distinguished from the maranta. The best arrowroot is adulterated by mixing with it, or substituting for it, the inferior kinds, or sago-meal, which, being exceedingly cheap, is very commonly made use of for the purpose, either alone or mixed with potato starch. The microscope affords the best means of detecting these substitutions; but the test with hydrochloric acid is a very serviceable one for ordinary purposes.

ARROWROOT, as used for infants, 284.

ARROWROOT PUDDING, as made for infants, 285.

ARSENIC.—A metal which is the base of the several oxides and salts known as white arsenic, orpiment, &c., all of which are poisonous in the highest degree.

ARSENIC, Symptoms of poisoning by, 172; treatment of poisoning by, 509.

ARSENIC, Sale of.—The following Act has been recently passed to regulate the sale of poisons:—

(*Summary*)—14 Vict., c. 12.

1. Every person selling arsenic shall, before its delivery, enter in a book to be kept for that purpose a statement of the quantity of arsenic thus sold, and the purpose for which it was stated to be required. Also the date and place of sale, and the name, place of abode, and condition or occupation of the purchaser. Such entry to be signed by the purchaser; or, if he professes not to be able to write, the seller to affix the words "cannot write."

2. No person to sell arsenic to another unknown to him, unless the sale is made in the presence of a third party, who is known to the seller, and who also knows the purchaser. Such third party to sign his name, together with his place of abode. No person to sell arsenic to any one under full age.

3. Arsenic, when thus sold, to be mixed with soot or indigo, in the proportion of one ounce of soot, or half an ounce of indigo, at least, to one pound of arsenic; provided that, when it is stated that the arsenic is

wanted for any other purpose than agriculture, for which such admixture would render it unfit, it may be sold unmixed, in quantities of not less than 10lbs. at one time.

4. Penalty for not complying with the above, upon a summary conviction before two justices of the peace in England, Ireland, or before two justices of the peace or a sheriff of Scotland, £20.

5. This Act not to extend to arsenic when it forms part of a prescription written by a legally qualified medical practitioner, or in wholesale or retail dealings, upon an order in writing in the regular course of trade.

ARTERIES.—The cylindrical tubes which convey the blood from the heart to every part of the body. They are divided into two large sets, one of which propels the blood from the right side of the heart to the lungs, while the other distributes it from the left side of the heart to the whole of the body. Both of these sets communicate with the veins by still smaller vessels called capillaries.

ARTERIES, Structure of.—Every artery is composed of three coats. The *external* is fibrous and strong, serving as the chief means of resistance to the distension of the vessel, and also to connect it with the surrounding parts. The *middle* coat is yellowish in colour, and so brittle that it is easily cut through by a ligature, leaving the external coats entire. The *internal* coat is a serous membrane, smooth, thin, and shining.

ARTERIES, Degeneration of the coats of, page 141; chronic diseases of, 141; treatment of diseased, 473; mode of tying when wounded, 395.

ARTERITIS.—Inflammation of an artery, 140.

ARTICULATION.—See *Joint.*

ASCARIS LUMBRICOIDES.—The round worm, 157.

ASCARIS VERMICULARIS.—The maw-worm, 157.

ASCARIDES, Removal of, 330, 331.

ASCITES, or dropsy of the abdomen, Symptoms of, 83; treatment of, 412 (*par.* 1293).

ASIATIC CHOLERA, Symptoms of, 54, 55: causes of, 55, 56; treatment of, 378, 379.

ASPHYXIA.—The scientific name for suspended animation, 512.

ASS'S MILK.—The milk of the ass resembles that of the human female very closely, and is very useful as a food for delicate children brought up by hand, as well as for consumptive patients, and children with diseased mesenteric glands. It contains more sugar than cow's milk; and the proportion of curd is also not so great.

ASSAFŒTIDA.—A gum resin, 226.

ASSIMILATION.—The process by which the digested food is made into a fluid, which becomes capable of organization. As far as our present knowledge goes, this change is a conversion of albumen into fibrine, and it is chiefly effected in the mesenteric glands and liver. See *Digestion*, 153.

ASTHMA, Humoral (see *Chronic Bronchitis*), 48; treatment of, 373.

ASTHMA, Spasmodic, Symptoms of, 49; treatment of, 374, 375.

ASTRAGALUS, Treatment of dislocation of the, 423.

ASTRINGENTS, Action of, 188; list of mineral and vegetable, 190; as used for infants, 269; formulas of, for adults, 345.

ATMOSPHERE. See *Air, Atmospheric.*

ATONIC.—Deficient in power or tone.

ATROPHY.—Disease of the mesenteric glands, 137; symptoms of, 137, 138; treatment of, 325, 326.

AUSCULTATION.—The art by which the condition of internal organs is discovered by examining the exterior of the body with the ear. This is effected either by placing the ear directly on the skin, or by interposing a wooden cylinder, called a "stethoscope," between it and the observer's ear. The former plan is quite as good as the latter, or even better in certain states; but in others the stethoscope is to be preferred, and in all is desirable when the delicacy of the observed or of the

observer is to be considered. There is, however, so much practice required in obtaining a knowledge of the various sounds given out in respiration, coughing, &c., that it is of little use to any one but the scientific physician.

AXILLA.—The arm-pit (which see).

AXUNGE (*Hog's lard*).—Used in making many ointments and cerates.

AZOTE (*Nitrogen*).—An elementary gas. See *Nitrogen.*

BACK (*Dorsum*).—The part of the posterior aspect of the body between the neck and the loins, and composed of the dorsal vertebræ, the roots of the ribs, and the muscles and skin covering them.

BACON.—The flesh of the hog salted and dried, and sometimes smoked. It is a very useful article of diet, though somewhat rich for a delicate stomach.

BALSAM.—A vegetable substance somewhat resembling an oil—as balsam of Peru, copaiba, Tolu, &c.

BALDNESS, Nature and causes of, 73; treatment of, 391, 392; in children, 309.

BANDAGES AND BANDAGING, 265, 266.

BARK, Cinchona, three kinds of, 229; decoction of, 232; tincture of, 245.

BARK, Oak, decoction of, 233.

BARLEY GRUEL, as used for infants, 284.

BARLEY, Pearl.—The grain prepared by removing the husk and rubbing the kernel into a rounded form. Used in making barley-water and soups, &c.

BARLEY, Prepared.—Ground barley used for various purposes as food.

BARLEY-WATER, Method of preparing. See *Decoction of Barley*, 232, 248.

BARLEY PUDDING, 292.

BARRENNESS.—An incapability of breeding in the female, arising from a variety of causes.

BASILIC VEIN.—See *Bleeding*, 257 (*par.* 937)

BASILICON, Yellow.—An ointment made with three parts of yellow wax, three of resin and four of olive oil, heated together and stirred till cold. Used for drawing or stimulating indolent ulcers.

BATHS.—Vessels made of marble, copper, tin, or iron, in which the whole or part of the body is immersed in water or other fluid, or from which water, air, or vapour is poured over it. They are of various sizes, as the hip-bath, the slipper-bath, the full-bath, the shower-bath, vapour-bath, &c. These several kinds of baths are described at 254, 255, together with some others in the chap. treating of *Hydropathy*, 204, 205, 206. Turkish, see APPENDIX.

BATHS, Temperature of, 255.

BATHING.—This term implies the special immersion of the whole or part of the body in any medium, but ordinary atmospheric air. Many substances have been thus employed, as milk, oil, warm and cold sea-water; cold, tepid, and hot fresh water; vapour, and hot air. The methods of using the ordinary baths are given at pages 254, 255; and for the *Hydropathic Processes*, 204, 205 206.

BATHING, Sea, 255.

BATH WATERS.--Certain hot springs at Bath, in Somersetshire, have long been celebrated for their good effect in rheumatism, paralysis, and neuralgia, as well as in those diseases which come on from a residence in warm climates. They are taken both internally and externally; and in the latter mode, they are used by many persons at a time, and for hours together, so that the mind is amused during the process. The following are the solid contents in a pint of water:—

Muriate of magnesia .	1·6
Muriate of lime . . .	1·2
Sulphate of lime . . .	9·5
Sulphate of soda . . .	0·9
Silex	0·2
Oxide of iron	0·01985
Loss	0·58015
Saline matter	14 grs.

Carbonic acid 1·2 cubic inches.

BATTER-PUDDING, for children, 293.

BATTLEY'S Sedative liquor of opium.—A well-known and most valuable preparation of opium, the process for making which is kept secret. It is one-third stronger than laudanum, and appears to have a greater sedative effect with less stimulation of the nervous system.

BERIBERI.—A disease peculiar to the East Indies and Ceylon, characterised, according to Dr. Mason Good, by "spasmodic rigidity of the lower limbs, impeding locomotion, often shooting to the chest, and obstructing the respiration and the voice, trembling of the extremities, painful stupors, and general œdematous swelling." The administration of mercury seems to be the most beneficial in treating this complaint.

BED, Guarding of the, in labour, 498.

BED-CHAIR.—Various plans are employed for supporting invalids in bed in the sitting position, and a chair is made for the purpose which is capable of being lowered or raised to any angle. When such a contrivance is not at hand, nothing answers better than one or two ordinary chairs turned upside down, and their backs placed against the patient, of course guarding them with pillows.

BED-ROOM, Ventilation of the, 8.

BEDS AND BED-ROOMS of children, 296.

BED-SORE.—An ulcer which occurs in consequence of long-continued pressure of the projecting points of the body upon the bed. It is chiefly met with in emaciated subjects who are in the last stage of exhausting diseases, such as typhus fever, consumption, &c., in which the points of bone are not only unnaturally sharp from the removal of the fat which covers them, but the vital powers are also at so low an ebb, that they do not resist the tendency to destruction, which in a state of health they would be able to withstand with comparative ease. Sometimes bed-sores make their first appearance as a brown or whitish-brown dry slough, with a defined edge, surrounded by a slight blush of inflammation; but generally there is more or less redness and soreness of the skin for some days before an actual sloughing or mortification of its substance takes place. If not carefully dressed and attended to, these sores are very painful, and often discharge so much as to reduce the already exhausted powers to a state from which there is no rallying. Indeed, there are numberless instances of fever, in which the fatal result is owing to the additional drain produced by the discharge from these sores, so that nurses should be very careful to attend to the first indications which they present. The *treatment* of bed-sores is partly preventive and partly curative, the former being the most simple and effectual. It consists in a careful bathing of the skin, as soon as it becomes at all inflamed, with hot brandy-and-water, or with a pint of hot water in which a tea-spoonful of tincture of arnica has been mixed. After this has been done for a few minutes, the part should be well dried, and then dusted with fine starch powder, or violet powder, or fuller's earth; or, if it appears highly probable that, in spite of every precaution, a sore will make its appearance, it is better at once to have recourse to a water pillow or bed, using one or other according to the extent of the mischief. These are much more effectual than the air-cushions, which *will* press too much on some part, in spite of every precaution; while in the case of the water-pillow, the pressure is perfectly uniform, and the points, however sharp, receive no more than the hollows of the body. Mr. Hooper's water-pillow or bed is by far the most efficient for this purpose (see *Bed, water*). But, supposing the sore to be actually produced, it must be considered as an ulcer and treated as such, according to its state (see *Ulcers*, 392), only taking care to remove the pressure which originally caused it, by the use of the water-pillow or bed, as already described. If an air-pillow is em-

ployed it should be one with a hole in it. In relieving the inflammation and tendency to superficial inflammation which occurs in the early stage of bed-sores, *collodion* is most useful, and it may be brushed on by any one with a light hand once a day. It gives some little pain for a few minutes if the cuticle is removed, but afterwards the relief is more than sufficient to counterbalance this; and by its means a superficial ulceration may often be at once healed, which, if dressed in any other way, would most probably have ended in a deep slough. See *Collodion.*

BED, Water.—Dr. Arnott has invented a most ingenious method of entirely relieving any partial pressure, by placing the patient in a trough half full of water, but prevented from wetting him by a *loose* lining of Indian rubber, which is attached all round to the upper edge of the trough. The objection is, in the first place, that it abstracts heat too rapidly; and in the second, that it condenses the perspiration, so as to keep the clothes constantly damp. Mr. Hooper, of Pall Mall, to meet these objections, has contrived a water-bed, which is capable of being placed on an ordinary mattrass, *after which* it is filled with water to the depth of about four inches, when the average weight of the body will generally be supported from the bed by the quantity of water displaced. It answers the purposes most effectually, and is a most valuable protective agent in cases of serious fractures of the pelvis, &c., or of severe bed sores, especially in very old people. They may be either purchased or hired.

BEE, Treatment of stings from the, 400.

BEE'S-WAX.—A good application for ulcers of the legs, 265.

BEEF-TEA, Method of making, for invalids, 247; for infants, 284.

BEER.—See *Malt Liquor.*

BELLADONNA, Symptoms of poisoning by, 176; treatment of poisoning by, 511; plaster of, 241.

BELLY.—See *Abdomen.*

BENZOIC ACID, 222, 232.

BENZOIN, Compound tincture of, or Friar's Balsam, 245.

BEVERAGES, suited for the nursery, 294; for invalids, 249.

BICARBONATE OF POTASS, 241.

BICARBONATE OF SODA, 243.

BILE, Composition and use of the, 96.

BILE, Deficiency of.—A symptom of passive congestion of the liver, or of organic disease of that organ, or of obstruction of the biliary ducts, 99, 100, 101.

BILE, Excessive secretion of.—A symptom of active congestion of the liver, 99; or of bilious diarrhœa, 53; or of English cholera, 54.

BILIARY DUCTS, Symptoms of congestion in, 101; treatment of congestion in, 444.

BILIOUS FEVER, Symptoms of, 28, 29; treatment of, 357, 358.

BINDER.—The towel or bandage pinned or tied round the hips after the conclusion of labour, 499 (*h*).

BISCUIT-POWDER, as a food for infants, 284.

BISMUTH.—A metal, which unites as a base with oxygen and the various acids.

BISMUTH, Trisnitrate of, 226.

BITES, Treatment of, 399.

BITTER-SWEET, or *Woody-nightshade*, Symptoms of poisoning by, 176; treatment of poisoning by, 511.

BLACK DROP.—A strong preparation of opium, two or three times as powerful as laudanum.

BLADDER.—The hollow organ which receives and retains for a time the urine as fast as it is secreted by the kidneys. This fluid enters it through two narrow and thin tubes (the ureters), which extend from each kidney to the back of the bladder, the coats of which they enter obliquely, so that when it is distended no regurgitation can take place; and for this reason a bladder may always be distended with air, as we daily see exemplified, when the lower opening or the outlet is tied. This is called the neck of the bladder, and is surrounded by a gland called *the pros-*

tate in the male; but from the point where the bladder ends the passage is called the *urethra* in both sexes. In the female it is short and nearly straight, while in the male it is about nine or ten inches long, with a considerable curve. The bladder is partially covered with *peritoneum* on its upper and back surface, and has a strong muscular coat, by which it empties itself, assisted also by the abdominal muscles. It is lined by mucous membrane.

BLADDER, Symptoms of inflammation of the, 56; treatment of inflammation of the, 380; treatment of gravel in the, 447, 448; treatment of stone in the, 449; treatment of bleeding into the, 450.

BLAINS.—See *Blebs.*

BLANC MANGE for invalids, 247.

BLEBS, Symptoms of, 66; treatment of, 312.

BLEEDING, Operations for, 256, 257, 258; hemorrhage, 145; treatment of, 334, 358, 478, 479.

BLINDNESS, or loss of sight, may occur from almost any of the diseases of the eye-ball, 162.

BLISTER-PLASTER. See *Plaster of Cantharides*, 241.

BLISTERS, Methods of producing and dressing, 262; care required in using for young children, 269.

BLOOD, Composition of the.—This fluid is obtained from the food by the processes of *digestion* and *assimilation* (see the articles on these subjects), and being thus supplied with the substances of which it is composed, it becomes necessary to investigate its exact nature at the time when it is to be used for the purposes of secretion—in fact, for the whole of the actions going on in the machine. Whilst circulating in the living vessels, it may be seen, under the microscope, to consist of a transparent and nearly colourless fluid, termed *liquor sanguinis*, in which are certain *corpuscles*, some of which are red, and others colourless. But when this blood so composed is drawn from the body and allowed to remain at rest, a coagulation takes place, separating it into *clot* and *serum.* The former of these is composed of a network of fibrine, in the meshes of which the corpuscles of both kinds are involved, whilst the latter is the *liquor sanguinis* before mentioned, but deprived of its fibrine, which has united to that in the clot. Thus, the blood in the living body, and the same fluid out of it, are somewhat differently arranged, though both consisting of the same ultimate elements. This will be seen from the following results of its examination:—

(*a*) *Blood in the living body* is composed of—

Fibrine	Forming with water the *liquor sanguinis.*
Albumen	
Saline matters	
Red corpuscles	Suspended in *liquor sanguinis.*
Colourless do.	

(*b*) *Blood, when coagulated*, consists of—

Fibrine	Forming the clot.
Red and white corpuscles	
Albumen	Together forming the serum.
Saline matters	

(*c*) *The proportion of solid matter to water* is from 200 to 210 in 1000 parts made up as follows:—

Albumen, about	70
Corpuscles (red and white)	125
Fibrine	2½
Chloride of sodium and potassium	4
Phosphate of soda	2½
Phosphate of lime	
Phosphate of magnesia	
Sulphate of soda	
Phosphate of iron	
Oxide of iron	
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(*d*) *The use of these constituents* in the animal economy is of great importance, because upon their relative value will depend the quantity of each kind of food intended to replace them. The *albumen* is the raw material from which are elaborated, during the nutritive process, many, or in fact most, of the substances necessary to existence, and among the rest the fibrine itself. All the albuminous compounds of the secretions, the horny and gelatinous matters of the nails, hair, and skin, the solid parts of the corpuscles of the blood, and the greater parts of the tendons and ligaments, are composed of this useful element. The *red corpuscles* appear to be more connected with respiration than with nutrition; and they are chiefly useful in stimulating the muscular and nervous systems to a due performance of their functions. The *fibrine* is the material which is the most completely prepared for organization, and which supplies what is requisite for the formation of the muscular and other fibrous tissues. It differs but very slightly from albumen in chemical composition, and it is said by many chemists that it is impossible to distinguish between the two by analysis; but in physical character there is the peculiar addition to fibrine of its tendency to coagulate as soon as it is removed from the body, while albumen requires a temperature of 150 degrees to effect the same change. This new feature appears to be owing to some vital addition, with the nature of which we are unacquainted, and which our senses and chemical tests have no power to grasp. The proof of this is not complete; but when we find this power lost in cases of death by lightning, or any active poison, it is reasonable to suppose that it is in consequence of the effect upon the vitality of the fluid. With regard to the *saline matters*, their use seems to be in part to prevent the decomposition which would otherwise take place, and in part also to supply the mineral materials requisite for the building up and repair of the several tissues and entering into the composition of the secretions.

BLOOD, Circulation of the.—The nutritive fluid when formed is carried into the various parts of the system by the organs of circulation. This movement answers various purposes, the chief of which is to furnish a supply of nourishment to all the tissues, by which they are enabled to live, and in some cases to pour out their proper secretions. The former of these functions is called nutrition; and in its exercise different materials are drawn from the blood, according to the tissues to be repaired. Thus, the nutrition of muscle requires fibrine; that of the nerves requires fatty matter, together with phosphorus and albumen; while the bones demand gelatine and earthy salts, the former being, like fibrine, very similar to albumen. Among the secretions the same remark applies—thus, the bile removes the fatty matter, and other elements peculiar to it; the urine takes off urea and some saline matters; and the milk, when such a secretion exists, separates albumen, sugar, and fat. In this way, the various portions of the blood, when returning from the organs to which they have ministered, have undergone very different changes by these nutritive and secreting processes, according to the nature of each organ supplied; and if the same portion of the circulating fluid were constantly transmitted to each organ and returned from it, it would be wholly unfitted for its office; but, by the general mixture in one common centre (the heart and lungs), this change is prevented, and the whole mass is preserved in its regular and healthy condition, some organs serving to remove certain noxious matters, while others supply what is wanted; but each acting upon a certain portion to such an extent, as to serve for the whole mass. Such is the primary object of the circulation—namely, to carry to every part the blood in a pure state, and return it again to a central organ; and being also mainly useful in mixing the whole into a properly prepared and average proportion of materials. It is carried out by the arteries and returned by the veins, and these consist of two distinct sets. See *Arteries* and *Veins*.

BLOOD, Depuration of the.—In this process, the liver and kidneys, as well as the skin and the mucous membranes generally, take an active part; but the chief organs employed are the lungs. In the passage of the blood through the body, it has changed its colour and composition, being converted from arterial into venous blood, and having absorbed a considerable quantity of carbon, obtained during the decomposition of the tissues. To extricate this is one of the purposes of the respiratory process; another being to maintain the proper temperature of the body, especially when in a state of rest. It is known that every muscular action developes heat in the muscle contracting; and it is believed that in every change of tissue the same effect is produced, though in a less degree; but this is not sufficient at all times, and if it were not for respiration the body would frequently sink below the temperature at which it can maintain its vitality. But the function of respiration has for its object, not merely to extricate the carbonic acid which is generated in the system, but likewise to introduce the oxygen which is required by that acid; the proportion of oxygen in the tissues, and in the combustible materials of the blood, not being sufficient for this purpose. Hence it is not enough that the carbonic acid should be removed, for this may be effected in an atmosphere deprived of oxygen; but the latter gas must be offered in a condition fit for absorption; and thus not only is carbonic acid given out and oxygen taken in, but the two actions are effected by the very same process, and at the same time heat is generated by the union of the carbon given off with the free oxygen of the atmosphere. The organs by which this is effected consist of a mass of cells, composing the lungs, on the thin walls of which the blood is exposed to the air in a state of such minute division as to present a very extended surface, with a thin membrane only intervening.

BLOOD, Extravasation of, 120; symptoms of chronic diseases of the, 131 *et. seq.*; as plethora, 131; anœmia and chlorosis, 132; cachexia and scrofula, 133; treatment of chronic disease of the, as plethora in the adult, 467; anœmia, *ib.*; chlorosis, 468; cachexia, 469; scrofula, 470, 471, 472; treatment of chronic disease of the, in the infant, 322, 328.

BLOOD-VESSELS, Chronic diseases of the, 141, 124, 143; treatment of, 473, 474, 475, 476.

BLOOD, Determination of, to the head, 118.

BLOOD-LETTING.—See *Bleeding*, 256, 257, 258.

BLOWS.—See *Contused Wounds*, 397.

BLUE DISEASE arises from a malformation of the heart at birth, 277, 278.

BLUE PILL.—Pill of mercury, 241.

BLUE VITRIOL, 231; symptoms of poisoning by, 174; treatment of poisoning by, 509.

BODY LICE, Destruction of, 487.

BOILS, Nature of, 70; treatment of, 388.

BOLUS.—A large pill.

BONE, Structure and composition of, 92; covering of, or periosteum, *ib.*; development of *ib.*; of the teeth, 93.

BONE, Symptoms of inflammation and congestion of, 93; of abscess of, 94; of caries of, *ib.*; of necrosis of, *ib.*; of exfoliation of, *ib.*; of fractures of, *ib.*; of anchylosis of, *ib.*

BONE, Treatment of inflammation of, 429; of abscesses of, 430; of caries of, *ib.*; of necrosis of, *ib.*; of fractures of, 431, 440.

BONES of the body.—See *Skeleton.*

BORAX.—A compound of boracic acid and soda, 226.

BOUGIE.—A solid instrument of wax, composition, or metal, used to dilate the urethra, when affected with stricture.

BOURNEMOUTH.—A small village on the coast of Hampshire well sheltered from cold winds, and tolerably well fitted for the winter residence of invalids.

BOWELS.—The intestines. See *Alimentary Canal.*

BOWELS, Symptoms of inflammation of the, see *Enteritis*, 84; also, of the mucous membrane of the, see *Diarrhœa* and *Dysentery*, 52; treatment of inflammation of the mucous membrane of the, 376; also, *Enteritis*, 412; in the infant and young child, 305.

BOWELS, Confined, see *Constipation;* relaxed, see *Diarrhœa.*

BOWELS, Chronic disorders of the, 485; from excess of bile, *ib.*; with want of tone, *ib.*

BRAIN (*Cerebrum*).—The large mass of nervous matter which occupies the skull, 113.

BRAIN, Functions of the, 114; symptoms of the inflammatory and congestive diseases of the—as slight disorders of, 116; fainting from deficient blood in the head, *ib.*; delirium tremens, 117; determination of blood to the, 118; concussion of, *ib.*; apoplexy, 118, 119; extravasation of blood in, 120; phrenitis, or acute inflammation of, *ib.*; chronic inflammation of, *ib.*; atrophy of, *ib.*; hypertrophy of, *ib.*; white or yellow softening of, *ib.*; red softening, *ib.*; hydrocephalus, 121, 124.

BRAIN, Effects of inflammation on the —as paralysis, 124, 125; lead palsy, 125; shaking palsy, *ib.*; various kinds of headache, 125, 126, 127; tubercles in the, 138.

BRAIN, Treatment of the diseases incidental to the—as irritation in childhood, 319; passive congestion in, 320; hydrocephalus, 320, 321; congestion of, in the adult, 456; fainting from defective circulation, 457; delirium tremens, *ib.*; determination of blood to the head, 458; concussion, 459; compression, 459, 460; with paralysis, 460; acute inflammation of, 461; chronic inflammation of, 462, 464.

BRAIN, Structure of the membranes of the, 114; inflammation of the membranes of the, 121.

BRANKS.—The Scotch name for mumps, 107.

BRANDY.—A spirit which was originally prepared by distilling the fermented juice of the grape; and it is to be hoped that this process is still carried on to some extent. A large portion, however, of that sold in this country is confessedly of British manufacture, and is distilled from malt spirit, after which it is flavoured with some of the ethereal compounds which are now so extensively used for the purpose. Pale brandy is the purest liquid, the dark colour being given by the addition of burnt sugar.

BRANDY, French or Cognac.—An admirable stimulus when properly applied, and not abused by constant drinking.

BRAN.—The outside coarse skin of the grain of wheat, removed after grinding by the dressing-machine. Used to make bran poultices, and to boil to make washes for the skin. In bread it is useful in relieving constipation.

BRAN POULTICE, 263.

BREAD, Baker's.—A great variety of articles are sold by bakers as bread, which may be enumerated as—1st, *best wheaten bread;* 2nd, *household bread;* 3rd, *brown bread;* 4th, *fancy bread;* 5th, *unfermented bread;* 6th, *plain biscuits;* 7th, *fancy biscuits.* The materials of which these breads are composed consist of flour, together with other substances, as water, salt, milk, butter, sugar, &c.; and, in addition, one or other of two substances, in order to develop carbonic acid gas within the bread, and thus produce a degree of sponginess or lightness, which is not only agreeable to the palate, but also aids the digestion within the stomach, by admitting the gastric juice and other solvents, as the saliva, &c., to the interior of the bread. These consist of—1st, *yeast*, either common, German, or patent; and, 2nd, the use of *carbonate of ammonia*, or *carbonate of soda*, and *tartaric acid*, or *carbonate of soda* and *hydrochloric acid*, which last mixture is most commonly used—the acid, seizing on the soda, gives off carbonic acid gas, and the new combination remains in the bread in the form of common salt. This last is an ingredient in all bread; and, therefore, it is supposed, that if two articles are employed which leave nothing behind but salt and carbonic acid, there can be no harm done; whilst, at the same time, a considerable saving is effected by avoiding the fermentation of the bread, and consequent conversion of part of it into carbonic acid gas and alcohol. Sometimes a baker offers "unfermented bread" to his customers, and in such a case it is well to know that nothing can be gained by it in point of digestibility, because it is well known that the use of yeast is quite free from all objection on the score of health, and that the only reason for employing the soda and acid is, that they are always available, and that a greater weight of bread may be produced by their aid than with that of barm; but as the cost of the former is somewhat greater than that of the latter, in point of economy there is really no gain, and in point of trouble, the advantage is slightly in favour of the yeast.

BREAD, Home-made. — The first thing to be done is to select the flour, and decide upon the kind which is to be used. There is not the slightest doubt that undressed wheat-flour is most suited to the stomach of man, and will support him better, under all circumstances, than any other kind. It is also more nourishing; and for children, particularly, is better suited, because it contains in the bran a larger proportion of the bone-making elements. These facts are now so clearly established upon scientific principles, that they are generally acknowledged. But when the stomach has long been accustomed to fine bread, it will not bear the irritation of the bran, and in such a case finer flour must be chosen; that called "firsts" need never be fixed upon, as the "seconds" will agree with any stomach. Where economy is much studied, Indian-meal may be mixed with wheat-flour with advantage, as it is very nearly as nourishing, and costs very much less money. Rice and potatoes mixed with flour make an equal *bulk* and *weight* of bread at a less price, but though they satisfy the appetite as well as wheat-flour, they do not supply the wants of the system; and the labouring man who expects to be able to work upon bread made with them as well as upon good wheaten bread will be greatly disappointed. Nevertheless, for a family of children, a shilling's worth of bread made in this way will go farther than an equal value of wheaten bread; though if these same children were fed upon equal *weights* of the two for equal consecutive periods, the difference would be very manifestly in favour of the pure wheat. Boiled rice and potatoes contain plenty of nourishment of one kind—namely, starch; but they have scarcely a vestige of those nitrogenised principles which go to build up the muscles and bones. But for those families where meat, or bacon, or milk, or any kind of animal food, is used in any quantity, potatoes and rice may be mixed with wheat-flour to a certain extent without injury; inasmuch as these animal foods contain nitrogen enough for the demands of the system. The housekeeper will therefore remember—1st, that for hard work there is no bread like wheaten bread; 2nd, that children do better with a liberal supply of bread made of wheat and rice, or wheat and potatoes, than with a scanty quantity of wheaten bread; 3rd, that when plenty of animal food is to be had, these last-mentioned breads, or that made of the seconds, wheat-flour, and Indian-meal, is quite nourishing enough for all ordinary purposes, and considerably cheaper in price. *The method of making wheaten-bread* in quantities adapted to ordinary families is as follows:—Take two pecks of flour, put it in a deep pan or trough, and make a deep hole in the middle, then take half a pint of good fresh yeast, mix it well up in half a pint of warm water, and pour it into the hole made in the flour. Next, take a spoon and work it round the outside of this central pool of water, so as to bring into it by degrees enough of the flour to make a thin paste or batter, which should be well mixed up without breaking down more than enough of the surrounding flour. Lastly, take a handful of flour and scatter over the top of this, upon which a thick cloth is to be laid, the flour preventing its sticking to the paste. The whole must now be put by to rise, either near the fire if in cold weather, or at a distance if in the summer. When the batter has risen enough to crack the layer of flour scattered over it, the "sponge" is sufficiently risen, and it may be formed into *dough*, thus:—Begin round the central hole as before, but using the hand instead of a spoon, and working the flour in to the batter, at the same time adding more lukewarm water, until it is sufficiently moist, or, for some kinds of bread, milk instead. A quarter of a pound of salt is to be incorporated, either in the kneading or by dissolving in the water. When all is mixed together, the dough still requires to be well kneaded, in order to mix the fermented batter with the rest of the flour, and to get rid of the lumps of the latter, which would otherwise remain unmixed with water. The dough must, therefore, be well worked with the fists and heels of the hands, rolling it over and pressing it out, then folding it up and pressing it out again, until it is completely mixed and formed into a stiff yet tough dough. The bakers often use their naked feet for this operation, and there is no reason why feet should be more uncleanly than hands; but it is not desirable to imitate this operation in our own kitchens. When the dough is thus made up, it is rolled into a lump, and put into the trough again, well floured on the surface to keep it from sticking; and there it should remain for about twenty minutes, when it may be divided into portions suited to the size of the intended loaves.

BREAD, Digestive.—Under this name various kinds of bread are sold; but it is generally meant to be supposed that the bread so called is made without yeast, by the use of soda and acid, as mentioned under the head of *Baker's Bread*.

BREAD, Gluten.—This is made of semola or of flour, and gluten. It is used in *diabetes*. See *Treatment of Diabetes*, 452.

BREAD-AND-MILK.—Not suited for babies till fifteen months old, 284; for older children, 291.

BREAD-POULTICE, 263.

BREAD-PUDDING for children, 284.

BREAKFAST HOUR for children, 290.

BREAKFAST DISHES for Children, 291.

BREAST (*Mamma*).—The breasts are glands intended to provide nourishment for the new-born child. They are met with in both sexes, but in the male are only rudimentary. In the centre of each is a small prominence of the integument called the *nipple* (*mamilla*), which is surrounded by an *areola*, which in the female before impregnation, is of a delicate pink colour, but afterwards becomes brown, and enlarges greatly in size (see *Pregnancy, signs of*). In *structure*, the breast is a conglomerate gland, consisting of various lobes and lobules, which give off small milk-ducts, and these coalesce until they form from fifteen to twenty-five, which open at the extremity of the nipple.

BREAST, Abscess of the, 504; treatment of the, *ib.*; management of the, after labour, 502, 503, 504.

BREAST, Swelling of, in infants, 279.

BREATH, Shortness of.—A symptom occurring in pneumonia, 76; pleurisy, 79; bronchitis, 48; phthisis, 135; broken ribs, 440; dropsy of the chest, 80; abdomen, 83; and in organic diseases of the liver, 100.

BREATHING, Rapid.—A symptom occurring in pneumonia, 76; pleurisy, 79; bronchitis, 48; phthisis, 135; croup, 51; hooping-cough, 49; and in all fevers, 23 *et seq.*

BREATHING, Painful.—A symptom of inflammation of the substance of the lungs, 76; of the pleura, 79; or of a broken rib, 440; or of pleurodynia, 81 (*par.* 243).

BRIGHT'S DISEASE, Symptoms of, 203; treatment of, 447.

BRIGHTON, the well-known watering place, is remarkable for its dry and bracing air; but it is not fit for consumptive and delicate invalids in the early spring. See *Climate.*

BROCOLI.—A very nutritious and digestible variety of the cabbage tribe when well boiled.

BROKEN BONES, Treatment of. See *Fractures*, 431, 440.

BRONCHITIS, Acute, Symptoms of, 48; treatment of, 373.

BRONCHITIS, Chronic, Symptoms of, 48, 49; treatment of, 373, 374.

BRONCHITIS, Spasmodic, Symptoms of, 49; treatment of, 374, 375.

BRONCHITIS, Senile, Symptoms of, 49; treatment of, 49, 375.

BRONCHITIS, Infantile Acute, Treatment of, 303.

BRONCHITIS, Infantile Chronic, 303.

BRONCHOCELE, Symptoms of, 109; causes of, *ib.*; treatment of, 454, (*par.* 1381).

BRUNSWICK GREEN, Symptoms of poisoning by, 274; Treatment of poisoning by, 508.

BROOM.—A popular and efficient diuretic. It is used in the shape of an infusion (*broom tea*), which is made by pouring a pint of boiling water over a handful of the green tops, and letting it stand till cold. This quantity should be taken during the day at three or four doses, and the addition to it of a quarter of an ounce of cream of tartar increases its efficacy.

BROOM, Compound decoction of, 232.

BROTH.—A weak decoction, made from *mutton*, *veal*, or *chicken*, by boiling them slowly in water for some hours. After letting it stand, the fat is skimmed off, and then the herbs or flavouring required may be added, and it is warmed up for use. It is well suited for the *diet* in convalescence from acute diseases, being less rich than beef-tea or soups.

BROW-AGUE, or *Brow-ache*, Symptoms of, 127; Treatment of, 464.

BRUISES, Treatment of. See *Contused Wounds*, 397.

BLEBS, Treatment of, 312.

BUBO.—An inflammatory swelling of an absorbent gland in the arm-pit or groin, symptoms of, 110; treatment of, 455.

BUCKTHORN, Syrup of.—A popular aperient, seldom however sold in a genuine state.

BUCHU.—A foreign medicinal herb, 226; infusion of, 234.

BUGS, Mode of destroying, 487.

BULLÆ (*Blebs* or *Blains*), Symptoms of, 66.

BUNION, Treatment of, 391.

BURGUNDY PITCH.—A resinous substance, which is used for spreading on leather by means of a heated spatula or knife, and forms a popular application to the chest in coughs.

BURNS, Treatment of, 400, 403.

BURSÆ.—Small synovial bags (see page 77), the chief of which are situated on the knee-cap, on the point of the elbow, and on the ball of the great toe, where they give rise to painful swellings when enlarged.

BURSÆ, Inflamed.—When the bursa on the knee is inflamed, it gives rise to a considerable swelling called "housemaid's knee," which may be relieved by leeching and cold lotions, or by blistering, or by the continued use of the remedies prescribed at page 413. The similar enlargement on the point of the elbow may be treated in the same way. When it occurs on the ball of the great toe, it is called a "bunion," which see.

BUTTER.—The oily part of milk, which is contained in its cream, in which condition it is confined in little globular cells, and these being broken in churning the oil escapes, and the various particles coalesce to form the butter. It is a very wholesome article of diet when mixed in due proportions with less rich materials.

BUTTER, Melted. — Cold butter melted in water or milk, with the addition of a small quantity of flour. It is partially converted into an *emulsion.*

BUTTER-MILK.—The serum which remains after the butter is removed from the cream. In most dairies it is sour, because the cream is kept for some days before it is churned; but in the Devonshire method of butter-making it is sweet and agreeable to any palate. Butter-milk is sometimes given in fevers and acute diseases as a cooling drink, but is not equal to whey.

BUXTON.—An inland watering-place situated in Derbyshire, and celebrated for its springs, which somewhat resemble those of Bath. See *Climate.*

CABBAGE.—A common vegetable containing a large proportion of nitrogen, and very nourishing to a strong stomach, but scarcely suited to a weak one.

CACHEXIA, Symptoms of, 133; causes of, *ib.*; treatment of, 469.

CÆCUM.—The commencement of the large intestine. See *Alimentary Canal.*

CÆSARIAN OPERATION.—The removal of a child from the womb by cutting through the walls of the abdomen into its cavity. So named, because Julius Cæsar is said to have been thus born.

CAFFEINE.—The active principle of coffee, upon which it depends for its invigorating effect. See *Coffee.*

CALAMINE.—A native carbonate of zinc, 226.

CALAMINE, Cerate of, 228.

CALCULUS.—A hard substance formed in the liver (see *Gall-stone*), or in the kidneys (see *Gravel*), or in the bladder (see *Stone*), or in the salivary glands (see *Salivary Calculus*).

CALOMEL.—The chloride of mercury, 238.

CALORIC (*Heat*) is the name given by chemists to the agent (whatever it may be), which produces the phenomena peculiar to itself, and which also receive the same name. In theory it is supposed to be a subtile fluid, the particles of which repel one another, but are attracted by all other substances. It is imponderable, and by its distribution in various proportions among the particles of matter, gives rise to the three forms known as *gaseous*, *liquid*, and *solid*. Thus water (a liquid), by losing caloric, has the cohesion of its particles so much increased as to become ice (a solid), while by adding caloric they again become liquid; or by adding still more, their cohesion is destroyed, and they expand into a vapour (the gaseous form). *Caloric* may be *free* or *combined.* In the former condition it gives the sensation of heat, and causes other bodies to expand, the amount of it contained being called its "temperature." And as certain bodies expand equally with the degree of their temperature, instruments are contrived, called "thermometers," which by the expansion of mercury, or spirit, or other substance, measure it exactly. In the latter state, or when *combined*, heat is not so obvious to the senses, as when solids during liquifaction imbibe a quantity of it beyond what they indicate when in contact with the thermometer. The same is the case with liquids when converted into the gaseous forms; in either case a portion of the caloric, which is essential to the condition of the new product, ceases to be apparent, and a sensation of cold is produced. So, again, when the density of bodies is increased, the reverse takes place, and heat is developed, which before was "latent;" and thus we have iron made hot by hammering, or cold sulphuric acid and cold water becoming hot when united, because they occupy less space than the sum of the two when separate. The *sources* of caloric are—1st, the sun's rays; 2nd, combustion; 3rd, percussion; 4th, friction; 5th, the chemical mixture of different substances; and 6th, electricity or galvanism.

CALORIC, Conduction and radiation of.—Free caloric has a tendency to establish an equilibrium, so that any number of bodies unequally heated, when exposed to air of the same temperature, gradually arrive at an equality in the amount of the caloric they contain. Hence we feel any substance which we touch to be either *hot* or *cold;* but this varies greatly according to the *conducting power* of the material, which, if it is comparatively great, gives a more perceptible sensation of either than if it is low. Thus, metal is a much better conductor than wood, and feels much colder to the touch, although it really is of the same actual temperature, as measured by the thermometer. But besides this power of conduction, there is also another, by which bodies give off their heat, even where there is no air (as in a *vacuum*), and this is called *radiant caloric.* This property is only exercised in direct lines, and through free space, being reflected from solid or liquid substances, or sometimes absorbed by them, in which latter case their temperature is proportionately increased. The nature of the surface considerably influences the absorption or reflection of radiant heat; and it is found that a polished metal surface reflects nearly all the particles which fall upon it, while a rough, and especially a dark one, absorbs in the same degree All these several facts are of importance in the management of our dwellings and of our clothing, as we find that a partially polished and smooth slate roof is much hotter than one covered with rough tiles, or with thatch, which, though they are less capable of reflection, are worse conductors, and, therefore, do not heat the interior nearly so much.

CALUMBA, or *Calumbo.*—A stomachic bitter.

CALUMBA, Infusion of, 235.

CAMBOGE, or *Gamboge.*—A drastic aperient gum. It is scarcely fit for domestic use in any dose.

CAMPHOR, 226; liniments of, 237; mixture of, 239; compound tincture of, 245.

CANCER.—A malignant disease, 160; symptoms of hard, 160; symptoms of soft, 161; symptoms of jelly-like, *ib.*; of the eye, 163.

CANCER.—Treatment of, 487, 488.

CANCRUM ORIS, Symptoms of, 165; treatment of, 335.

CANELLA BARK.—An aromatic spice used with aloes. See *Wine of Aloes.*

CANINE TEETH.—See *Teeth.*

CANTHARIDES.—Spanish or blistering flies (*lyttæ*), 226.

CANTHARIDES, Plaster of, 227; dissolved in acetic acid, *ib.*; cerate of, 228; tincture of, 245.

CANTHARIDES, Symptoms of poisoning by, 174; treatment of poisoning by, 510.

CAOUTCHOUC.—See *India-rubber.*

CAPILLARY.—Hair-like. The word is applied in anatomy to the minute vessels which intervene between the arteries and veins. See *Circulation.*

CAPILLARY ATTRACTION. — A phrase invented to explain a law of nature, which causes liquids to rise in tubes of a certain size above the level which they would otherwise attain. Thus, if a glass tube of the diameter of a half or third of a line is dipped into water, or any liquid which has a tendency to adhere to its material, the liquid will rise very considerably above the height of the surrounding surface. In the same way, a piece of sugar or a sponge will quickly absorb a quantity of liquid in which its lower surface only is placed.

CAPSICUM.—The plant from which cayenne pepper is made, 227.

CARAWAY SEEDS, 227; oil of, *ib.*

CARBON.—A substance which exists either in a solid state, as diamond and plumbago, or in a more impure form, as charcoal. It constitutes a large proportion of all organic substances. It unites with oxygen to make carbonic acid and with hydrogen to form carburetted hydrogen, &c.

CARBONATE OF LEAD, Symptoms of poisoning by, 174; treatment of poisoning by, 509.

CARBOLIC ACID, 222.

CARBONIC ACID GAS is always produced by the combustion of any material containing carbon in atmospheric air; or it may be obtained by decomposing a carbonate of lime, or soda, or potass, &c., by any acid which has a stronger affinity for the base than it has—as, for instance, lemon juice or tartaric acid when added to the solution of bicarbonate of soda. It is the essential ingredient in all brisk or effervescing liquids, such as sparkling Champagne, Burgundy, &c., in which it is developed by fermentation; and also in soda water, ginger beer, effervescing lemonade, &c. Taken thus in small quantities it is a stimulant; but if inhaled either by itself or with a considerable admixture of air, it suspends animation altogether, 513.

CARBONIC ACID GAS, Treatment of suspended animation from, 513.

CARBUNCLE, Symptoms of, 70; treatment of, 389.

CARDAMOM SEEDS, 227.

CARDAMOMS, Compound tincture of. A warm aromatic cordial, 245.

CARDIALGIA. — Synonymous with *Gastralgia*, 484.

CARDIAC.—Belonging to the heart, or near to it, as the cardiac orifice of the stomach.

CARDITIS. — Inflammation of the substance of the heart.

CARIES, Symptoms of, 94; treatment of, 430.

CARMINATIVES.—Medicines which relieve flatulence, such as peppermint, dill, aniseed, caraways, &c., 269.

CAROTID. — An artery, called the *common carotid*, passes up tho neck on each side the windpipe to the head. It divides into the *external* and *internal carotids*, opposite the angle of the jaw; the former supplying the face, jaws, &c., and the latter the brain and eye.

CAROTIDS, Increased pulsation of.—A symptom of determination of blood to the head in chronic cases, 118; or in acute cases of inflammation of the brain, 120; or delirium tremens, 117; or sometimes merely of fever.

CARROT.—A wholesome root when well boiled.

CARROT POULTICE, 264.

CARRARA WATER.—Effervescing water holding carbonate of lime in solution.

CARAGHEEN MOSS, 248.

CARTILAGE.—A substance of a firm, elastic nature, which serves several purposes in the animal economy. In the first place, it is the original condition in which all the bones are formed, and they only become brittle when their cartilage is filled up with lime. 2nd. It is deposited in a thick layer upon the ends of all the bones where they form joints, and where it is lubricated by a thin fluid (the *synovia*). 3rd. It is sometimes made into a kind of pad or cushion, by which the jars and friction of the joints are diminished, forming what is then called an inter-articular cartilage, as in the knee, jaw, collar-bone, &c. 4th. It is inserted between the ends of bones in a very thick layer, without any synovia or capsule, as in the vertebræ where it forms the intervertebral substance, allowing of considerable bending of the whole spine by its elastic nature, and enabling the brain to sustain the severe shocks which the body suffers in leaping from a height, &c.; also, at tho anterior ends of the ribs, where a considerable portion of cartilage intervenes between them and the sternum.

CARTILAGE, Fibro. — Fibro-cartilage is a more elastic and yielding substance than ordinary cartilage, and is well exemplified in the *pack-wax*, or ligament of the neck of quadrupeds.

CASCARILLA BARK, 227; tincture of, 245.

CASSIA.—A warm spice, resembling cinnamon, and often substituted for it, being less expensive. See *Cinnamon.*

CASTILE-SOAP.—A soap composed of olive-oil and soda, and used in pharmacy, to make up certain pills with.

CASTOR-OIL.—A particularly mild aperient, 227, 228.

CASTOR-OIL, useful as a mild aperient for infants, 268.

CATALEPSY, Symptoms of, 150; treatment of, 482.

CATALYTICS.—A class of medicines, 188, 189.

CATALYTICS, Various kinds of, 342.

CATAMENIA.—The menstrual discharge of females, 167.

CATAPLASM.—A poultice.

CATARACT, Symptoms of, 163; treatment of, 490.

CATARRH OF THE BLADDER, Symptoms of, 47 (*par.* 140); treatment of, 370, 371.

CATARRH, Pulmonary, symptoms of, 47; treatment of, 370; in children, 303.

CATECHU.—An astringent drug, 228.

CATHARTICS.—Aperients, or purgatives, 191, 346, 347.

CATHETER.—A tube which is passed into the bladder to draw off the urine. They are of various sizes, numbered from 1 to 16, and the shape also differs considerably; but they are generally made for the male with a considerable curve, and for the female very nearly straight, and only half the length of the male catheter. Some little art is necessary to pass these instruments, and they require an actual demonstration of the method of performing the operation. They are made of silver and elastic gum, which last may be passed with comparative ease and safety by the inexperienced operator.

CAUL.—The omentum. A large apron of fat between layers of peritoneum hanging down in front of the bowels, and immediately behind the muscular wall of the abdomen. Sometimes also applied to the membranes in which the child is included before birth, and which are occasionally entire, or nearly so, when the child is born. In such a case, it is popularly said to be born with "a caul;" and by superstitious people, this is supposed to avert shipwreck and other serious misfortunes.

CAULIFLOWER.—A variety of the cabbage, closely resembling the brocoli in all respects.

CAUSTICS.—Strong chemical applications, which destroy the life of the part with which they are brought in contact. *Lunar caustic* is the most common of these. See *nitrate of silver*, 243; *blue stone*, or *sulphate of copper*, 244; *caustic potass (potassa fusa)* is also occasionally employed.

CAUTERY.—A red-hot iron applied with the view of rapidly establishing counter-irritation, or of causing an artery to cease bleeding. It is not often used in this country.

CAYENNE PEPPER is composed of the pods of several species of *capsicum*, which is an annual herbaceous plant, a native of America, but cultivated in the West and East Indies, and to some extent in this country Each pod is made up of three parts, an outer skin, an inner parenchymatous substance, and a quantity of small seeds. All these are ground up to constitute the pepper sold as cayenne; but it is to the first that it chiefly owes its pungent taste. It contains a very active principle which is called *capsicin*, and of which a very minute quantity, even as little as half a grain, diffused throughout a room will set a whole party of people sneezing.

CELLULAR MEMBRANE, Structure of the, 74; symptoms of inflammation and congestion of the, 74, 75; treatment of various inflammations of the, 404.

CELLULAR MEMBRANE, Treatment of inflammation in, attacking infants, 315.

CERATE.—A species of ointment, 228.

CERATE, Simple, 228; of calamine, *ib.*; of cantharides, *ib.*; of spermaceti, *ib.*: of acetate of lead, *ib.*; of resin, *ib.*: compound soap, *ib.*

CEREBRUM (the *brain*), structure of, 113.

CEREBRAL DISEASES. See *Brain, diseases of the*, 115.

CEREBELLUM.—A portion of the general mass of nervous matter called the brain, and situated at the posterior and inferior part of the skull behind the ear, and just above the neck. Erroneously supposed by the phrenologists to be the organ of amativeness, 113.

CERUMEN.—The waxy matter found in the passage to the ear.

CHALK.—Carbonate of lime.

CHALK, Prepared, 228; powder of, with opium, 242.

CHALK MIXTURE, 239.

CHALK STONES.—Collections of lithate of soda about the joints in gouty subjects, 88.

CHALYBEATES.—Medicines and natural waters containing iron, 189, 342.

CHALYBEATE SPRINGS. — The principal iron springs in this country are Cheltenham, Tunbridge Wells, Harrogate, Scarborough, and Leamington. See *Climate.*

CHAMOMILE FLOWERS, 228; infusion of, 235.

CHAMPAGNE. — The sparkling variety of this wine is well suited as a stimulus in the convalescence from very lowering fevers.

CHAPPED HANDS, Treatment of, 403.

CHARCOAL. — Impure carbon. It should never be burnt within the house in an open stove without a chimney, which will carry off the products of combustion with certainty. A disregard of this caution has caused death in many cases, from breathing the carbonic acid gas evolved from the combustion. See *Carbonic Acid Gas.*

CHARCOAL, Animal, 228; vegetable, *ib.*; poultice of, 242.

CHARPIE.—A species of lint, chiefly used in France.

CHEESE.—The curdy matter of milk pressed and dried. It contains considerable nourishment, but to delicate stomachs is hard and indigestible.

CHELTENHAM.—An inland watering-place, situated in a Gloucestershire valley, and containing saline and chalybeate springs, which are used internally alone. They are chiefly suited to the diseases of India; but the society and amusements of the place are its principle attractions. See *Climate.*

CHEST. — The upper cavity of the trunk or body. It is of a conical shape, with the apex upwards, bounded above by the neck, below by the diaphragm, which separates it from the abdomen (see *Abdomen*). Behind, its walls are made up of the spine and the roots of the ribs; on the sides, by the bodies of the ribs and the muscles between them; and in front, by the cartilages of the ribs and by the breast-bone (*sternum*). By the peculiar and slanting direction of the ribs, they enlarge the cavity, when the spaces between them are diminished, and when they are all elevated towards the neck, while the contrary takes place when they are drawn down again. These actions, assisted by the descent of the *diaphragm*, constitute *respiration*, which is divided into *inspiration*, in which the cavity is thus enlarged, and *expiration*, in which it is diminished (see *Respiration*). The chest contains the heart in the middle and a lung on each side, together with their vessels and nerves; also, the gullet as it descends to the stomach, and some other organs of trifling importance to all but the minute anatomist.

CHEST, Examination of the.—The state of the lungs may be ascertained by three different methods—1st, by examining the whole volume of the chest, and ascertaining the degree in which it is enlarged during inspiration—the former is easily effected by the eye, while the latter may be carried out by placing the hand upon the front of the chest, and directing the patient to draw a deep breath; 2nd, by tapping the chest with the end of the fingers (called *percussion*), when it should resound clearly if the lungs are not consolidated, while, if there are tubercles or hepatization, the sound is dull and heavy. Some practice is, however, required to discover the healthy standard with which to make a satisfactory comparison; 3rd, auscultation, or the use of the stethoscope. See *Auscultation.*

CHEST, Contraction of.—When it is found that the chest is contracted, every pains should be taken to procure its expansion by gymnastic exercise, kinesipathy (see page 209), and other similar means. By dumb-bells, or the various contrivances of gymnastics, calisthenics, and kinesipathy, much good may be done in the growing child; but after the frame is fully formed, there is no great chance of enlarging the volume of the chest.

CHEST, Inflammations of the.—See *Bronchitis*, *Pneumonia*, *Pleurisy*, *Phthisis*, *Pericarditis*, and *Carditis.*

CHEST, Water on, or Dropsy of.—See *Pleurisy.*

CHICKEN-POX, Symptoms of, 37; treatment of, 300.

CHICORY.—A root which is now much used to adulterate coffee. It grows readily in poor sandy soils, and yields about ten or twelve tons per acre in the raw state, which, when dry, will only make about one ton, or somewhat less. The roots are washed, sliced by a machine, and dried, after which they are powdered, and then sold at about 4d. per lb. But chicory itself is subject to adulteration; carrots, mangel-wurzel, and parsnips being employed for the purpose, as well as burnt-sugar, which, however, is only added to give colour, being in fact three times the price. Dr. Hassal describes several other substances as being used for the purpose, but not on his own authority, as far as regards the most offensive of them—viz., oak-bark tan, mahogany sawdust, baked horses' and bullocks' livers, and Venetian red. It is, however, doubtful whether these are used to any extent in adulterating either coffee or chicory; for while this last article is to be bought at 4d. per lb., one would suppose there would not be much temptation to go lower in the scale of fraud. It must, however, be remembered that the sale of chicory is legal, *if sold as such*, and that it is only when it is sold as coffee, or mixed with it when the article professes to be pure coffee, that a fraud is committed. No one conversant with the subject imagines that chicory is either useful or wholly innocent, but no one either imagines that it is so prejudicial to health as to make the legislature forbid its use. Indeed, while tobacco is encouraged, it would be inconsistent to forbid chicory, which is comparatively innocent; and, therefore, all that can be done is to enact that those who desire pure coffee shall have it when they ask for it, as far as this can be effected by legislative interference.

CHILBLAINS, Treatment of, 314.

CHILD BED.—See *Diseases peculiar to Women*, 497 *et seq.*

CHILDREN, Management of, in health and disease, 268, 336.

CHLORALUM, 229.

CHLORINE is one of those simple substances found naturally only in a state of combination, but capable of being separated when it assumes the form of a gas. It closely resembles iodine, bromine, and fluorine in its affinities, and like them unites with the metals and their oxides, as well as with some of the other gases, to form acids, &c. Chlorine is very abundantly found in nature, and forms, with sodium, common salt, from which it may readily be obtained. The most characteristic properties of chlorine are its powers of bleaching and disinfecting. The most stable organic colouring principles are instantly decomposed and destroyed by it, while the same result happens with putrid emanations, and probably also with *malaria.* The blue colour of indigo, for instance, resists sulphuric acid, but is converted into a dull brown by chlorine. In its employment as a disinfectant, some care is required, as a strong evolution of the gas is not unattended with danger to the mucous membrane of the lungs. It is generally employed in combination with *lime*, *zinc*, or *soda.* See *Contagion and Disinfectants.*

CHLORIDE OF LIME, 229, 338. See also *Disinfectants.*

CHLORODYNE, 229.

CHLORIDE OF ZINC, 229, 338. See also *Disinfectants.*

CHLORIDE OF ZINC, Treatment of poisoning by, 510.

CHLORAL HYDRATE, 228.

CHLOROFORM.—A new volatile liquid which is capable of producing *anæsthesia*, or freedom from pain, when inspired. It should not, however, be employed without the presence and sanction of a medical practitioner, as it is attended with considerable danger if the patient is not in a fit state to inhale it, or if

it is continued for too long a time. The method of inhaling it is simple enough, consisting merely in pouring a tea-spoonful on a white handkerchief folded two or three times, and then applying this lightly to the mouth and nose, a long breath is inhaled again and again until the effect is produced. If insensibility does not soon come on, more chloroform must be added, and if it is complete, the handkerchief must be removed. It requires, however, some little practice to know the proper quantity to give, without which either too much will be inspired attended with danger, or too little, when the consequence is that the pain is not relieved. It is also used internally, 229, and externally, 349.

CHLOROFORM, Symptoms of poisoning by, 175; treatment of poisoning by, 511.

CHLOROSIS, Symptoms of, 132; treatment of, 467, 468.

CHOCOLATE is prepared from the seeds of the *theobroma cacao*, and closely resembles *cocoa* in its composition, though somewhat more rich (see *Cocoa*). As a beverage, chocolate requires for its proper preparation a muller, which is a part of the chocolate pot. The handle comes through the lid, and is rotated rapidly between the open palms. Scrape one ounce or two of the chocolate cake, and put it in with an ounce of sugar, over which half a pint of boiling water is to be poured, then put on the fire and turn the muller with one hand till it boils up, when an equal quantity of hot milk is to be added, and the whole well mulled with both hands on a stove or hot plate. When sufficiently frothy (or mulled) serve.

CHOCOLATE, Receipt for making, suited to invalids, 248.

CHOKE-DAMP.—The popular name for carbonic acid. See *Carbonic Acid.*

CHOKING, Treatment of, 512, 513.

CHOLAGOGUES.—Medicines which act on the liver, 191.

CHOLERA,. English, symptoms of, 54; treatment of, 378.

CHOLERA, Malignant, or Asiatic, symptoms of, 55, 56; treatment of, 378, 379.

CHOREA (*St. Vitus' Dance*), Symptoms of, 150; treatment of, in children, 329.

CHRONIC.—The opposite of *acute*, as applied to the progress of disease. See *Acute.*

CHYLE.—The fully digested food as prepared for absorption, and contained in the small intestines, 153.

CHYLOPOETIC VISCERA.—Those organs of the abdomen which convert the food into chyle—viz., the stomach, liver, and pancreas.

CHYME.—The half-digested gruel-like food, as contained in the stomach, before it passes into the duodenum, 153.

CICATRIX (*a scar*).—The remains of a wound which has been healed.

CINCHONA BARK, Varieties of, 229; decoction of, 232; tincture of, 245.

CINNAMON AND CASSIA are the bark of two species of *cinnamomum*, that producing the former bearing the specific name of *zeylanicum.* The cinnamon tree is cultivated chiefly in Ceylon, but sparingly in Bombay, Malabar, and Java. The bark as sold is peeled from the three-year-old branches, and dried in the sun, and its quality varies considerably, but its external characters are generally pretty nearly the same. Cassia, or the bark of the *cinnamomum cassia*, is brought from China, Malabar, Bombay, and the Mauritius; it resembles the true cinnamon in flavour, though less delicate and not so sweet, and attended with a certain degree of bitterness. It is constantly substituted for cinnamon; and it is necessary, therefore, to endeavour to distinguish the one from the other by our ordinary senses if possible. *The bark of cinnamon* is not much thicker than drawing-paper, and breaks with an uneven margin, showing a coarse arrangement of its fibres. It also consists of several concentric layers of bark, one within the other. These are called *quills*, and are of a pale brown, with a sweet aromatic taste, unaccompanied by any bitterness or astringency. *Cassia bark* is considerably thicker and coarser, and has a short fracture and smooth edge. It has generally only one, or at most two, quills within the external one; and the *taste* is a coarse imitation of cinnamon, with a strong tendency to leave an astringent bitter on the tongue. By these characters the bark of the one, when whole, may be distinguished from the other; but when powdered, the aid of the microscope is required to detect the imposition, which is extensively practised, and, failing this, the character of the vender is the only safeguard. Cassia buds are also imported.

CIRCOCELE.—A varicose enlargement of the veins of the testicle; also called varicocele, 474.

CIRCULATION OF THE BLOOD. See *Blood, Circulation of the.*

CITRATE OF IRON.—Iron united with oxygen and citric acid. It is a very useful chalybeate, 236.

CITRATE OF QUININE AND IRON.—A combination of iron, quinine, and citric acid. Extensively used in *chlorosis*, &c., 342.

CITRIC ACID.—A vegetable acid found in the lemon and lime, as well as in other fruits. It is a compound of carbon, hydrogen, and oxygen, and readily unites with the alkalies, with which it forms the salt called a *citrate*. It is often adulterated with tartaric acid; for which reason, and because of its superior fragrance, *fresh* lemon-juice is generally preferred, 223.

CLAIRVOYANCE, 214, 215.

CLARET.—A light and very wholesome French wine, well suited to many diseases of the stomach.

CLARET, To mull, 249.

CLARET MARKS, 390.

CLAVICLE.—The collar-bone.

CLAVICLE, Treatment of dislocation of, 423; treatment of fracture of, 436.

CLEANLINESS, Importance of, 10, 11.

CLEFT-PALATE, 491.

CLERGYMAN'S SORE THROAT. (*Aphonia clericorum.*)—This is a form of chronic inflammation of the larynx and back of the throat, which is accompanied with great passive congestion of the whole of the parts about the organ of voice. It appears to arise from the disproportion which exists in clergymen between the muscular effort which is made in speaking and the general exercise of the muscles of the body in a way to promote health. It is never met with in those who use their lungs far more, but in whom such use is accompanied by every kind of excitement; and thus the impassioned orator, and even the street-preacher, are never troubled with it. It is the constant depressing work of the week, followed by the unexcited delivery of the orthodox clergy, which produces this disease. For this reason it is, that it has lately become prevalent, because our ancestors were wise enough to know that health cannot be maintained without some change from one regular occupation, especially if that one is a particularly depressing one, as is the case with the visiting the sick poor. Hence it is found that the best remedy is not to give up using the voice only, but to give up also all parochial duty, and to take an amusing and exciting tour, which seldom fails to remove the mischief, though it will assuredly return with a repetition of the cause which produced it. If this simple and effective method of cure is not attainable, stomachics, especially the mineral acids, must be given internally; and at the same time the local treatment for chronic laryngitis (372) should be commenced by the use of nitrate of silver, and will probably palliate the effects of the disease.

CLIFTON HOT-WELLS.—A watering place close to Bristol, in Somersetshire, suited to delicate invalids in the winter and early spring, the lower part of it being sheltered from the east by the hill on which it is built. The spring is somewhat similar in composition to that of Bath, but not so warm in temperature, being about 76° F. But it is chiefly as a place of winter residence that Clifton is now patronized. See article *Climate.*

CLIMACTERIC DISEASE. — Over and above the gradual wearing down of the organs described under the article *Age*, there is also observed, at a certain period of life, a sudden change in the health, which lasts for an indefinite time, usually not very long, and to which the term *climacteric disease* has been applied, or popularly "*a break-up of the constitution.*" It is better characterised in men than in women, and occurs somewhere between fifty and seventy-five. Generally there appears to be some particular cause for the change, such as a disorder of the digestive organs, or a fatiguing and harassing journey, or a marriage late in life, or some mental anxiety, which last seems to act in the majority of cases. The *symptoms* are a marked alteration in the expression of the countenance, with wasting of the muscles and fat, a quick pulse, wandering pains in the head or body, sluggish bowels, and very often an unusually free secretion of urine, often accompanied by œdema of the legs. The sleep is broken and the spirits are low, with a general feeling of lassitude. After a time these uncomfortable feelings may go off, and there is a return of comparative health and strength, but not equal to what they were before; or on the other hand, the patient sinks under the disease, which may be characterized as a general failure of the functions. The above is the form in which this affection appears in those who have enjoyed good health up to the time of its invasion; but in those who have always been delicate, it is merely an aggravation of the predominant disease. When this is the case, it is somewhat difficult to separate the effects of the new disease from those of the original source of deranged health; but the peculiar change of countenance, which shews a kind of premature old age, serves to indicate what has supervened.

CLIMATE.—By this term is understood, when speaking medically, the condition of the atmosphere in a particular locality, in connection with its soil, winds, amount of foliage, &c. The influence of climate is now so thoroughly admitted, that it is needless to discuss the question here, especially as it is alluded to at page 4; and it is only necessary to describe the chief features of the various climates, which may either be selected for invalids, or to which they may of necessity be sent. The advantages of "change of air" have been insisted on under the article with that heading; but here we shall have to consider not only the benefit which is thus derived, but the relative superiority, or the reverse, of such climates as are best known. Sir James Clarke has given this subject a very full share of his attention; and for an account of those with which I am not myself acquainted by experience, I must draw upon his valuable researches.

In England the climate has been considered by him under four great divisions. 1st, the *South Coast;* 2nd, the *South-west Coast;* 3rd, the *Land's-End* in Cornwall; and 4th, the *Western Coast*—and these are, perhaps, all the places which are suited to the patient with confirmed consumption; but there are certainly others farther north quite as well adapted to the cure of many other disorders. There are, also, many individuals who are never well at or near the sea-coast, and for them it would, of course, be absurd to choose such a situation. Still, as it is for pulmonary consumption that a mild climate is more particularly needed and sought for, the remarks which he has made will be generally useful.

On the South Coast, which includes that portion between Hastings and Portland, including the Isle of Wight, the best season is in the six winter months of the year. After March the temperature begins to be a little above the mean of the interior in the south of England.

and in the summer months it is considerably so. The most desirable places may be set down in the following order — namely, Undercliff in the Isle of Wight, Hastings, Brighton, and perhaps Weymouth. *Undercliff* is the most sheltered of these, and has also a good summer climate. *Hastings* comes next in point of shelter, being situated at the base of a steep range of hills, which protect it from the north and north-east. *Brighton* is more exposed to the north, and has a more dry and bracing air; and, though not so well adapted for consumptive patients, is well suited to dyspeptic and neuralgic cases. The autumn is its best season, and at that time it is as mild as most places, and free from the noxious influences arising from the decay of vegetable matter, which is always to be found where there is much foliage. *Weymouth* of late years has been somewhat out of fashion; but it is well adapted for consumptive, and also for dyspeptic, cases.

The South-west Coast, which takes in all between Portland and Cornwall, is remarkable for the mildness of its winter climate, the temperature of the air in the three winter months being, on the average, four degrees higher than that of London, which is more than double the difference between the latter place and the South Coast, exclusive of Undercliff. The most advantageous residences for the invalid in this part of England are Torquay, Dawlish, Sidmouth, and Exmouth. Most of these spots are of very limited extent, the invalid being confined to a small valley, beyond which he at once experiences a great reduction of temperature, and is blown upon by boisterous winds. *Torquay* is an exception, where there is a considerable tract of country for the invalid to take his walks or drives in, and always some one road is sheltered from the wind, from whatever point of the compass it is blowing. Its climate is also more dry than usual in this district, owing, probably, to the presence of a range of calcareous rocks.

The District of the Land's End is remarkable for the little variation in its range of temperature, which is only 18 degrees as compared with 26 degrees, the average range of London. But to counterbalance this advantage, it must be confessed that the air is very moist, and the quantity of rain annually falling is nearly double that of the London district. *Penzance* and *Flushing* are the only two places which are frequented by invalids—the former, being deficient in shelter from the northerly and easterly winds, is not well adapted for their residence during the winter; while the latter, though well protected from these points of the compass by a range of hills, is deficient in accommodation, and confined in its dimensions. Both the two last divisions are too moist and relaxing to constitute them a suitable permanent residence for the invalid; and for this reason, those who winter there should by all means make a change during the summer months, or they will find their health give way from this excess of moisture relaxing the frame. Indeed, it is only to those who are naturally irritable in their mucous membranes and dry in their skins that this climate is suited, while to the relaxed habit they are particularly prejudicial.

In the West of England and South Wales, Clifton, Weston-super-Mare, and Tenby may be classed together as the chief places of resort. Of these *Clifton* possesses an exciting, bracing, and dry air, not so mild as the three districts already alluded to, and therefore not so well suited to pulmonary complaints, though the lower part is well sheltered from the east winds. It is particularly serviceable in neuralgia, dyspepsia, and scrofula. *Weston* is not desirable on any account, excepting to those who have little choice, having a muddy beach and a relaxing air without any counterbalancing advantages. *Tenby* is by far the most delightful watering-place in this division, being mild in its winter temperature, and free from autumnal vegetable decay. It is one of the best climates in England for the general run of invalids who require sea-air, and is only inferior to Undercliff and Torquay for those who are afflicted with pulmonary complaints.

Among the Inland Watering-places suited to the invalid, in addition to Clifton above alluded to, may be enumerated *Cheltenham*, *Malvern*, *Leamington*, *Tunbridge Wells*, *Matlock*, *Harrowgate*, *Buxton*, *Bath*, all of which have some natural "well" which is celebrated for its virtues, but which is of little use to the consumptive patient. The "waters," however, serve in many dyspeptic cases to amuse the mind, if they do nothing else; and sometimes, perhaps, they are of real service, especially those impregnated with iron, in which that metal seems to be contained in a form which is more readily taken into the system than in the shape of an artificial drug. Some are celebrated for the purity of the water—as, for instance, Malvern, in which it flows from a granite range, and is therefore not impregnated with lime. But even there the air and exercise do the real good which is derived; and the same, I believe, may be said of most of these places.

AMONG FOREIGN CLIMATES suited to invalids, the following may be considered as eligible for that purpose:—

Pau, in the south of France, has been much frequented of late years by invalids from this and other countries. It is situated at the base of the Pyrenees; but, nevertheless, it possesses a mild winter climate, though it is a little subject to changes of temperature. In the spring it is particularly eligible, being only two and a half degrees colder than Rome at that period, and five degrees higher than Penzance. It is also free from fogs, and has a dry soil, so that on the whole it may be considered as the best climate for invalids in the south of France. It possesses one great advantage in being so near the watering-places of the higher Pyrenees, which allow a change to them in the warm season without the fatigue of a journey.

Montpellier, situated in the south-eastern part of France, is a most improper residence to be selected for a consumptive patient, being high and exposed to cold piercing winds. It is, therefore, quite out of fashion in this country.

Marseilles is less exposed than Montpellier, and is particularly dry and bracing, so that its climate is well suited to dyspeptic patients, and to those suffering from the effects of *malaria*.

Hyères has the mildest climate of the south-eastern district of France, being sheltered from the northerly winds by a range of hills which are covered with shrubs and evergreens, the luxuriant growth of which sufficiently marks the nature of its climate.

Nice has long been celebrated for its mild winter, but its summer temperature is far too high for any class of invalids. It resembles the south-east of France in the general qualities, of its climate, but with the addition of some important local advantages, such as its protection from the northerly winds by a lofty range of mountains, which also give a degree of softness to the air beyond that of the above district, though still somewhat exciting. In the spring the winds are often cold, which is the chief objection to the place as a residence for pulmonary cases at that period, as well as for irritable mucous membranes of the stomach and bowels. On the other hand, for languid or torpid constitutions, it is well adapted, and in scrofula, chronic rheumatism, neuralgia, or cachexia it is likely to be of the greatest service.

In Italy, *Pisa* and *Rome* may be taken together, though the latter is somewhat warm in the winter, and is also more moist; but they are both well suited to bronchial and rheumatic affections. *Naples* differs somewhat from these places, in consequence of its vicinity to the sea, and the greater amount of wind to which it is subject; its air is also more exciting than Rome or Pisa, and is, therefore, inferior as a residence for pulmonary patients. All three of the above places are only fit for winter residence; and if confined to Italy, he must in summer betake himself to *Lucca* or *Sienna*.

Madeira is the climate of all others which is selected as a residence for pulmonary cases, and it most probably is superior to all other similar spots for that purpose. Nevertheless, there are other islands in the Atlantic which probably deserve nearly as high a reputation; and from their not being so much frequented, they are not associated with disease quite to the same extent as the island in question. Such are the Canary Islands and the Azores, as well as the Bermudas, though the last-named are more exposed to cold winds, and are, therefore, not so well fitted for consumptive patients. With regard to Madeira, it offers many advantages to the invalid besides its delightful climate, being well furnished with all the accommodations which are so essential to their comfort. It has a high central ridge of mountains which temper the warmth of the summer, and give the island the advantage of a cool land-breeze during the night, and the sea-breeze always prevails during the day; while it is within the course of the trade-winds, and these contribute to its coolness and salubrity. The range of temperature is far less than in the south of Europe, the winter being twelve degrees warmer than that of Italy and France, while the summer is five degrees cooler. It is also superior in the steadiness of its temperature from night to day, and from day to day excelling all parts of Europe in these respects. The rain likewise falls at more settled seasons, chiefly in the autumn, so that the air is dry and clear at other seasons of the year. Altogether it certainly richly deserves the high character which it has obtained.

The Canary Islands, of which the chief is Teneriffe, are somewhat warmer than Madeira, the mean annual temperature of Santa Cruz, the capital of that island, being seventy-one degrees, against sixty-five degrees, the mean annual temperature of Funchal, the capital of Madeira. But in the winter this difference is not so great, the former being then only five degrees warmer than the latter.

The Azores possess a mild but somewhat humid climate, less warm than Madeira in the winter, and also more oppressive during the summer. They are also somewhat deficient in accommodation for invalids.

The Bermudas are as well suited as Madeira in point of temperature, but are subject to all the storms of the Western Atlantic. They have also no internal ridge to temper the severe summer heat, and these, with the dry and rocky soil, render them unfit for the residence of the invalid.

The West Indies generally possess a mean annual temperature of 85 degrees, which is maintained within two degrees for the whole winter, and is consequently too high for most invalids. Exercise is forbidden by the cloudless skies and high temperature; and on that account, if on no other, the propriety of sending a consumptive patient to these islands under any circumstances is extremely problematical, though they may be well suited to those who require a constant relaxation of the skin, or who suffer from gravel or stone, or from scrofula or gout, all of which are complaints almost unknown in the West Indies.

From the foregoing remarks it may be collected that the following places are particularly suited to each kind of complaint for which *climate* is important:—

In Pulmonary Consumption.—Madeira, Pau, Rome, or Pisa; and in England, Undercliff or Torquay.

For Chronic Bronchitis, attended with much dry irritation, Madeira, Rome, Pisa, Torquay, Penzance.

Chronic Bronchitis, accompanied by much expectoration, will be more probably benefited by a residence at Nice, Pau, Clifton, Brighton, or Malvern.

Spasmodic Asthma will generally be relieved by the relaxing climates of Rome or Pisa, or by Madeira, Undercliff, or Torquay.

Chronic Rheumatism is relieved by the air of Rome or Nice, or in this country by Bath, Buxton, or Brighton.

Scrofula is generally benefited by a residence at the sea-side; but the more bracing situations should be chosen, such as Brighton or Tenby.

CLIMATIC INFLUENCE on health and disease, 4.

CLOTHING is of importance to the adult, whether an invalid or in strong health, especially in this variable climate. During the winter season, every one not in robust health should wear flannel next his skin about the chest; while those who are at all delicate should wear woollen drawers and stockings, and, indeed, should never be without wool in some shape next their skins. It is made into different materials in the present day suited to all skins however delicate, and to every variety of climate; for even in the tropics it is found that a fine flannel is more suited to the constant state of perspiration which exists there than calico or linen. The proper clothing of the feet is next to this in importance, and is less attended to than it ought. Hundreds of delicate females owe the first development of pulmonary disease to damp feet, from exposure to the wet of our roads without more protection than is afforded by a thin "kid" shoe or boot. The invention of the waterproof over-shoe has done much to rectify this defect; but, unfortunately, it is attended with another, consisting in the tendency, which is inherent in all perfectly waterproof materials, to keep in the natural perspiration, so that, *in exercise*, the feet become damp in spite of the perfect exclusion of the external moisture. They should never be worn for many consecutive hours, and even while remaining for half an hour in a house during a country visit they should be taken off. The adoption of the waterproof process, by which cloth is rendered *partially* impervious to wet, while it allows the escape of perspiration, is a great improvement upon the "Macintosh;" but it is only adapted for loose garments and for moderately severe storms of rain, not standing a long-continued "downpour," or a beating shower; nor is it proof against wet if subjected to friction, and, therefore, admits it if made up into tight-fitting coats or trousers. Between calico and linen there is a vast difference in point of conduction of heat (see *Caloric*), the former being a much worse conductor (and therefore warmer) than the latter, and coming next to wool among the clothing materials in common use. After it comes silk, and then linen; and, of course, the compounds of any two taking a place according to the proportion of each. Silk is sometimes worn next the skin, but is not equal to wool or calico. Wash-leather is warm *while dry;* but no sooner is it made damp by perspiration than its substance becomes close, and it feels clammy and cold, and is, therefore, a very bad material for the purpose. Much has been written against hats as a covering for the head; but I confess that though I do not like their appearance, yet there has been no substitute produced which is so well adapted to a variable climate. From the large bulk of air contained within them above the head, they form a good protection against the rays of the sun, while they also keep out the rain in a way which is not rivalled by the various "wide-awakes" and caps which have been brought out. Many head-coverings may be obtained which will suit either hot-and-dry, or cold-and-wet, weather better than the hat; but none, of which I am aware, will adapt itself so well to every emergency. Hence, I am not surprised that this article of clothing stands its ground.

CLOTHING of the Infant, 289; of the child, *ib.*

CLOTHING the Chest, Importance of, 253.

CLOVES are the flower-buds of the *caryophyllus aromaticus*, which is grown in the Molucca Islands, Sumatra, the Mauritius, Bourbon, Cayenne, Martinique, and St. Vincent. They present a peculiar oblong appearance too well known to need minute description, with a pungent and aromatic taste, which is highly agreeable to most people. Like the other spices, cloves contain an essential oil, besides resin, tannin, and woody fibre. The oil is extracted in considerable quantities, and sold separately for various purposes.

CLOVES, Infusion of, 285.

CLUB-FOOT, Varieties of, and their treatment, 428.

CLYSTER (Synonymous with *Enema* and *Lavement*).—An injection into the rectum. See *Enema*.

COAGULATION is the conversion of a fluid into a semi-solid form, as we see in the boiling of an egg. See *Albumen*, *Blood*, and *Urine*.

COAL GAS.—A compound of carbon and hydrogen, with a slight admixture of other substances, is one of the products of the destructive distillation of pit-coal, in which it is submitted to a great heat in cast-iron retorts. From this certain permanent gases are given off, as well as steam, volatile oils, and ammonia in small quantities, varying in their proportions according to the temperature used, which, if raised too high, increases the quantity, but diminishes the illuminating quality, of the gas. From the retorts the gas is collected in a large pipe, half-filled with liquid, and called the *hydraulic main*, after which it passes into a *refrigerator*, usually consisting of a series of iron pipes, cooled on the outside by a stream of water. In these the tar and ammoniacal liquid are condensed, and the gas proceeds to another part of the apparatus, where it is submitted to the action of the hydrate of lime, which absorbs the sulphuretted hydrogen and carbonic acid gases. This last apparatus is called the *purifier*, and it consists of a series of iron vessels, partly filled with a mixture of hydrate of lime and water in which an *agitator* is kept constantly in motion, so as to prevent the subsidence of the lime. The gas is admitted into the bottom by a great number of minute apertures, and is thus thoroughly submitted to the action of the lime. In this state it is generally supplied to the consumer; but to render it thoroughly pure, it should be passed through diluted sulphuric acid to remove what little ammonia remains. Coal gas thus manufactured and purified is collected in those large reservoirs called *gasometers*, from which it is supplied by large pipes called mains, afterwards branching off into lesser pipes to all parts of the town which are within a certain area. As gas is specifically lighter than air, the higher the situation to be supplied, the less pressure is required, and *vice versâ*; consequently gas-works are always placed in a situation as low as possible, when compared with the level of the parts to be furnished with it. Purified gas is supposed to consist of the following substances; but as the difficulties of analysis are very great, and gas also varies much in different seats of its manufacture, it can only be considered as an approximation to the truth:—

Composition of Pure Gas.

Light carbonated hydrogen.
Olefiant gas.
Hydrogen.
Carbonic oxide.
Nitrogen.
Vapour of volatile liquid carbides of hydrogen, which greatly increases the illuminating power.
Vapour of bisulphide of carbon.

Materials Separated in the Manufacture.

Tar and volatile oils.

Sulphate of ammonia, chloride and sulphide of ammonium.
Sulphuretted hydrogen.
Carbonic acid.
Hydrocyanic acid or cyanide of ammonium.

If coal gas is tolerably pure, the result of its combustion is not more injurious to health than that of any other lighting material; all giving off an amount of heat and carbonic acid gas in proportion to the degree of light obtained. See article *Lighting*.

COBWEB.—An old remedy in bleeding, used externally, and internally. Now quite disused.

COCCULUS INDICUS.—An East Indian fruit which is imported in the dry condition, presenting the appearance of a dark-brown wrinkled pea, within which is a bivalved one-celled fruit. The kernel is white and oily, and does not completely fill the shell. It has no smell, but is intensely bitter, and has considerable intoxicating power, so that it is used both for this property and for its bitter taste by brewers to adulterate their beer. It is sometimes employed in medicine to destroy lice, and also as an application to eczema or porrigo. The ointment is made by beating the kernels only, with four times their weight of lard, in a mortar until well incorporated. It should be used with caution, as there is danger of its absorption into the blood, producing the same effect as if taken internally.

COCHINEAL (*Coccus cacti*). — The entire insect killed by immersion in boiling water, and one of them constituting each grain of the drug as sold. It is chiefly used in medicine as a colouring matter for certain tinctures; but it is supposed to have some anodyne and antispasmodic power in hooping-cough, for which it is a popular remedy. It is given either in powder or in the form of the tincture, of which the dose is thirty drops for a child, 230.

COCOA is obtained from the same tree as chocolate (see article *Chocolate*), and is prepared according to the different forms in which it is to be used. Its powers are less exciting and stimulating than tea or coffee, though it contains a certain proportion of a similar principle; it is less rich than chocolate, and suits a delicate stomach much better. If *cocoa-nibs* or *flake-cocoa* are to be prepared, they require boiling slowly for two or three hours, half an ounce being sufficient for a pint and a half of water. The various *prepared cocoas* sold in tins, as Fry's, the soluble, &c., are made by mixing a tea-spoonful and a half in a little boiling water till dissolved, adding sugar to the palate, and then filling up with boiled milk, 16.

COCOA-NUT.—The fruit of a species of palm imported into this country as an article for the dessert, which is somewhat indigestible, and should not be given to children in any quantities.

COD-LIVER OIL.—This oil, obtained from the liver of the common codfish, is now largely employed in *consumption* and *scrofula* (see these articles). It contains, besides its oily properties which are well suited to afford nourishment to the frame, a certain proportion of the salts of lime, soda, and magnesia, besides phosphorus, iodine, and chlorine, with a trace of bromine. The *pale* oil contains the greatest quantity of iodine, bromine, phosphorus, and salts; while the *brown* oil is richest in the component parts of the bile, butyric, and acetic acids. It is supposed that the medicinal virtues are due to the presence of the above mineral substances in an *organic* oil easily digested and assimilated, 230.

COFFEE, used for similar purposes to tea, and containing a similar nitrogenized principle (called in this case *caffeine*, instead of theine)—is the berry of the coffee-tree which grows in America, the East and West Indies, Ceylon, Brazil, and Arabia, as well as some other warm climates. The plant is usually from four to five feet high, and the berries, which are gathered in the autumn, are of a dark red colour. Each tree yields about a pound or two of these berries, which contain within their pulp a pair of seeds enclosed in a thin membrane, and these, after being rubbed, washed, dried, and winnowed, constitute the raw coffee as imported and sold by the grocers when their customers intend to roast it themselves. When it is sold as roasted or as ground coffee, which implies a previous roasting, these berries are submitted to the action of fire in a closed chamber, until they are slightly charred, when they are cooled without exposure to the air, and then coarsely ground, and when not wanted for immediate use, they are preserved in tin canisters. As the oily matter contained in the berry is very volatile, it is desirable to avoid keeping either the whole berry or the powder longer than is necessary, and especially the latter; hence the grocer professes to roast and grind daily, and those who are in large business generally do so. The grinding at all events ought not to be more than sufficient for the daily supply; and it is in all cases better for the private customer to buy the berries either raw or roasted and grind them himself, rather than risk not only the loss of aroma by the exposure to the air, but also the adulteration with chicory, which is so generally practised. *The composition of the coffee berry* is of such a nature that it can readily be discriminated by the microscope from the substances with which it is adulterated, but by ordinary means such is not the case. There are probably tests by which chicory may be detected, but roasted beans or corn when ground can scarcely be known from inferior coffee by any mode of examination, except that adopted by Dr. Hassall. Two parts are plainly to be seen in the berry, as in all others of the same class—the substance and the investing skin; and these each present a peculiar appearance under the lens, (for which see Dr. Hassall's very beautiful woodcuts.) But, besides this, there is one fact which may serve as a guide, and that is, that the texture of the substance of the berry is a long time in becoming soft, whether it is roasted or raw, whilst chicory readily softens and becomes spongy, so that even in the ground state the two may be distinguished. The reason of this difference lies in the fact that the berry contains a considerable quantity of essential oil, to which it owes its peculiar smell on roasting, and which prevents its imbibing water and becoming soddened by it, whereas chicory has none of this, and therefore at once submits to the action of this fluid.

COFFEE, *when made into a beverage*, is even more stimulating than tea in its effects upon the system, but it is not followed by the same depressing effects. It also agrees with most stomachs, and while it supports the nervous and muscular system quite as well, or even better, it is not so liable to produce indigestion when taken in large quantities. It is made in a variety of ways, or, at least, with a great number of machines; but they may be divided into three—1st, *by simple boiling*; 2nd, *by boiling with concentration*; and, 3rd, *by infusion.*

(*a*) *Simple Boiled Coffee* is usually made in an ordinary coffee-pot, with a long spout and handle. From an ounce to two ounces of recently-ground coffee (with or without a proportion of chicory, the flavour of which is liked by some) is put in and heated on a hob or hot plate in the pot, which is to be filled up with one pint of boiling water, and put on a slow fire till it shows the slightest evidence of boiling, which it will do in a very few seconds. Then strain it through a muslin sieve or bag, and, after washing out the pot, return it into it, and warm up to the boiling point. After this it must stand on the hob for about five minutes, when it will pour out quite clear. *Another method* consists in tying up the coffee *loosely* in a muslin bag, and boiling it in the water for ten minutes, after which it may stand for a few minutes, and it will then be fine. *In the ordinary English method* the coffee is put into the pot with the water, and boiled up as above; a tea-cupful is then poured out, and returned into the body of the pot, after which it is allowed to stand five minutes, when it ought to come out clear.

(*b*) *The concentrated coffee*, used in France for making their *café au lait*, is often now made by the ordinary process; but in the old French families and hotels, the plan is adopted of making a very strong decoction, and boiling it slowly till it is concentrated to the colour and almost the thickness of treacle. This is, in fact, very similar to the essence of coffee sold in this country, except that it is made of genuine coffee, without chicory and liquorice, which is not often the case here. In making it the aroma is lost in great measure, but the raw flavour of the coffee, so much complained of by many people, is likewise got rid of. For mixing with large quantities of milk, this is particularly agreeable to the palate, but is not adapted for ordinary coffee as taken in this country.

(*c*) *To refine coffee* thus boiled, isinglass, white of eggs, sole-skin, and other kinds of albumen are sometimes used. When it is wished to be very clear, the best plan is to beat the white of an egg up with two or three table-spoonfuls of cold water, and mix that in with the dry coffee, which is then to be boiled as usual. The egg in coagulating entangles the fine particles of the coffee, and prevents them escaping into the fluid. This is far the best way of using egg or isinglass.

(*d*) *Infused coffee* merely requires a machine with a strainer perforated with fine holes, and when this is provided it matters not whether the water finds its way out by the force of gravity or by the power of the human arm. The machine should always be previously warmed, and if the infusion is made by two separate mashes, as in brewing beer, it will help to extract all the goodness better. For those who like the raw taste of the berry this plan is the best, especially as it does not allow the evaporation of the aroma; but I do not think it so well adapted for a delicate stomach.

(*e*) *All the above preparations of coffee* are either taken plain or sweetened with sugar, or syrup, or sugar-candy, and with boiled milk or cream, or both. If the first is used, the patent sugar is the best for the purpose.

COLCHICUM, Nature and properties of, 320; wine of, 245.

COLCHICUM, Symptoms of poisoning by, 176; treatment of poisoning by, 511.

COLD.—The condition in which heat is abstracted. See *Caloric.*

COLD, (see *Simple Fever*) 24; and its treatment, 351.

COLD, Catching.—By this term is to be understood the effect which is produced by sudden alterations of temperature upon the human frame, which are more sensibly felt in proportion to its delicacy, and to the artificial habits in which it has been reared. Thus, a "draught of air," which will cause a "cold" in a fine lady, is unfelt by the hardy artizan, or by the most aristocratic individual who accustoms himself to these changes of temperature by the bracing use of cold water, and by constant exercise in all weathers. It appears that the rapid abstraction of heat, like its sudden accumulation, has an effect upon the nerves as well as the small vessels of the body, but exactly the reverse of the stimulus of heat, which, when it is removed, causes a collapse or stagnation to take place. Here the effect of cold is to produce a sedative effect, and on its removal a reaction in the opposite degree sets in, and slight fever is developed, accompanied with congestion, and sometimes with inflammation of some internal organ. Such is the theory of the production of "a cold;" and when the congestion attacks any particular organ, in ordinary language it is said to "settle there," COLD AFFUSION.—See *Affusion* and *Baths*.

COLD CREAM, 404 (*par.* 1268).

COLIC, Symptoms of, 91; treatment of, 417.

COLIC, Painter's, symptoms of, 91; treatment of, 418.

COLICKY PAINS, in infants, treatment of, 316.

COLLAPSE.—A dangerous sinking or prostration of the powers occurring in the last stages of cholera and other diseases immediately dangerous to life. See *Cholera*, *Typhus Fever*, *&c.*

COLLAR-BONE (the *clavicle*).—A bone which extends from the middle of the upper part of the *sternum* or breast-bone to the outer part of the *blade-bone*, where it is attached by ligaments to two of its processes, the *acromion* and *coracoid*.

COLLAR-BONE, Treatment of dislocation of the, 423; treatment of fractures of the, 436.

COLLIQUATIVE.—When diarrhœa or profuse sweating occurs in the last stages of exhausting diseases, such as consumption, or hectic fever in any other form, they are said to be *colliquative*.

COLLODION is composed of *gun-cotton* dissolved in sulphuric ether, which forms an adhesive or gummy solution, transparent and colourless, and well adapted for several purposes in domestic surgery. It is applied by means of a camel-hair brush, which must be used rapidly and lightly or the substance becomes too thick before the operation is completed. If used for recent cuts, the skin must be so held that the edges are brought together, and if this is done while the *collodion* has time to dry, a perfect adaptation may be effected; but the adhesion is not very close, nor does it last many hours, so that for this purpose it is not very effectual; but for dressing *bed-sores* it is a most valuable application. See *Bed-sores.* It is also used to cause contraction of the vessels of the skin in *acne rosacea*, 388.

COLLYRIUM.—An eye-wash—that is to say, a lotion expressly intended for the eye.

COLOCYNTH (*bitter apple*, or *bitter cucumber*, of which it is the peeled fruit) is very generally employed as an ordinary aperient, 230.

COLOCYNTH, Extract of, 233; compound pill of, 240.

COLUMBO, Tincture of, 245.

COLON.—The middle portion of the large intestine, divided into the ascending, transverse, and descending-colon. See *Alimentary Canal.*

COMA is a symptom occurring in a variety of serious diseases of the brain, and is defined as consisting of "a suspension more or less complete of the powers of sensation, thought, and voluntary motion." It is not a decided characteristic of any one condition of the brain, but may exist as a consequence of very different diseases or disorders of its substance. Indeed, it is so difficult to define coma by any form of words which shall suit all its varying conditions, that though it is usually very easily recognised in practice, yet in theory it has caused numberless disputes among nosologists. It differs from fainting in the persistence of the action of the heart, which ceases in the latter; while it may be known from deep sleep or from lethargy, by the power of rousing the patient in them which does not exist in coma. It most frequently occurs in apoplexy, poisoning by narcotic drugs, and in complete intoxication. The following is, however, the list of the diseases in which it occurs as a decided symptom, viz.:—*Apoplexy*, 118; severe *concussion*, *ib.*—and *compression*, *ib.*—of the brain; *congestion of the brain* from the circulation in it of bile or urea, 116; the last stages of *typhus fever*, 25; and of other fevers where they become *typhoid*; the last stages of *inflammation* of the brain, 120; and of *hydrocephalus*, 121. See the various *diseases here mentioned.*

COMBUSTION.—Like many other well understood terms, it is not easy to define exactly what combustion is; but the usual definition is "a combination of two or more bodies attended with the evolution of heat and light." It is not yet ascertained *how* these are disengaged, but of the existence of the law there is no doubt whatever, subject to some few very unimportant exceptions.

COMBUSTION, Spontaneous.--A large number of cases are recorded, in which, without any apparent cause in the shape of fire sufficient to account for it, the human body has been partially or totally consumed; and it has been alleged that this has arisen from a spontaneous combustion of its materials. The human body is, no doubt, composed of combustible materials, while the air we breathe is composed of oxygen in part, which alone is wanted to effect the combination—that is to say, if the temperature is raised sufficiently high. But it appears that in all cases the bodies so burnt belonged to individuals who were addicted during life to the use of alcoholic liquors in an extreme degree, and that in fact they were impregnated with alcohol, which being highly combustible is supposed to increase the tendency to combine with oxygen in a degree sufficient to account for the occurrence at the ordinary temperature, supposing only that a light is applied by means of a candle, or contact of the clothes with a spark from the fire. Cases are recorded with great care and minuteness, in which a flame has appeared to issue from the mouth; and this is supposed to be caused by a diseased secretion of inflammable gas, which may be formed from the mucous membrane, in the same way as appears to be the case in several ordinary diseases, but consists here of a different material. Spontaneous combustion appears to be confined to the old and feeble, and to be more common among women than men. It spreads with great rapidity, so that the entire body has been consumed in a very short period of time. The flame is of a flickering nature, very difficult to extinguish with water, and not easily communicated to adjacent inflammable bodies. A strong smell of burning is usually exhaled, and a fetid, moist, and greasy deposit has been generally observed occupying the place of the consumed body. The trunk has in most cases been consumed, but occasionally parts of the head and limbs have been left uninjured. The cases are not of course of common occurrence, and it is barely possible that the supposed facts upon which they are founded are altogether fallacious; but the evidence, nevertheless, is so staggering as to satisfy any ordinary inquirer.

COMPLEXION.—The appearance of the skin with regard to colour and surface, which is to be closely watched by those who examine into disease, inasmuch as it has an important bearing upon it. Thus a *yellow colour*, especially if it also extends to the white of the eye, indicates that the liver is not acting properly, and if well marked, so as to assume a deep yellowish or greenish brown, jaundice is said to be established. A *muddiness* of the skin is a sign of dyspepsia, 153; a *paleness* of a peculiar kind, accompanied with white lips, is a sign of anœmia or chlorosis, 132. A *sallow* complexion is often natural to the individual, but if it suddenly comes on, it may be suspected there is some organic disease. If the complexion of the face is of a *deep red*, congestion of the brain may be expected, 116, 118; while if it is of a *purple-red*, or *absolute purple*, there is *congestion of the lungs*, 76; or *disease of the heart*, 144; or the last stage of *inflammation of the lungs* or *bronchi*, accompanied with *effusion*. See *Death Rattle*. A *lead coloured* skin is sometimes produced by the long-continued use of nitrate of silver, which has been deposited beneath the cuticle, and then oxidised and rendered thus permanently indelible from the insoluble nature of the oxide of silver.

CONCENTRATED ACIDS, Symptoms of poisoning by, 171, 172; treatment of poisoning by, 507.

CONCUSSION, or *Stunning*, Symptoms of, 118; treatment of, 459.

CONDYLE.—The extremities of certain bones where they expand to form the joint are called *condyles*, as in the *knee*, *elbow*, and *lower jaw*.

CONDY'S FLUID, Permanganate of Sodium, dissolved in water. See APPENDIX.

CONFECTION, Nature of, 230; of almonds, *ib.*; aromatic, *ib.*; of opium, *ib.*; of pepper, 231; of roses, *ib.*; of senna, *ib.*

CONGESTION, Theory of, 41; seats of, 43, 44; of mucous membrane, 46, 47; of the skin, 57 *et seq.*; of the cellular tissue, 75; of serous membranes, 78, 79; of muscular fibres, 90, 91; of the liver, 99; in the biliary ducts, 101; of the brain, 116, 119; of the spinal cord, 127, 128; of the nerves, 128.

CONGESTION, Treatment of, in the liver of children, 316; in the kidneys, 318; in the brain, 319; general treatment of, in adults, 363, 364; treatment of, in the cellular membrane, 404; in the lungs, 406; in serous membranes, 409; in the muscles, 418; in the liver, 441; treatment of, in the brain, 456 *et seq.*

CONGESTIVE HEADACHE, Symptoms of, 126; treatment of, 464.

CONIUM (*hemlock*), 231; used internally in the form of *extract* or *tincture*, or the *leaves* dried, or in the shape of *poultice*, 264.

CONIUM, Symptoms of poisoning by, 177; treatment of poisoning by, 511.

CONJUNCTIVA. — The membrane which covers the front of the eye, and also lines the lids, being reflected from one to the other, and being loosely bound at the angle; it allows of free motion of the eye in the socket, and of the lids also upon the eye; it is constantly lubricated by its own proper secretion, and by the tears which are poured out upon it from the lachrymal gland, the ducts of which pass through it, and end on its surface. In its ordinary healthy condition it is transparent, and shews a few small vessels only beneath it; but when inflamed, it becomes red and pulpy, and its vessels carry red blood instead of white. See *Eye, Anatomy of the.*

CONJUNCTIVITIS. — Inflammation of the conjunctiva. See *Ophthalmia, Common Acute*, 162.

CONSERVE.—Synonymous with *Confection*, which see

CONSTIPATION, Habitual, 157; treatment of, 346, 347, 486. See also *Cathartics* and *Aperients*.

CONSTIPATION attending pregnancy, treatment of, 497; attending sea-sickness, treatment of, 514.

CONSTIPATION. — A symptom of congestion or inflammation of the liver, 99; and bowels,. 82; also of colic, 91; dyspepsia, 153; hysteria, 148; fevers of most kinds, and hydrocephalus, 121.

CONSUMPTION, Pulmonary.—Symptoms of, 131, 132; treatment of, 470, 472.

CONSUMPTION, Soothing nourishment for, 248.

CONTAGION, Laws of.—The term *contagion* is used somewhat loosely, being sometimes applied to the matter itself by which a disease is conveyed from one person to another, and at others to the mere fact of its propagation. By some writers the term is restricted, in accordance with its etymology, to the result or act of absolute contact, as in itch, or in the inoculation of cow-pox or small-pox, where the insect or matter is visibly transferred from one person to another; while by them the term *infection* is employed to signify the communication of disease without contact; but modern writers generally employ the two terms synonymously, or at all events they use the word contagion as including also infection; and, on the other hand, some even go so far as to describe itch as an infectious disease, though this is not quite in accordance with the general practice. It may, therefore, be said that strictly speaking a contagious disease is one which requires actual contact to be propagated; while an infectious complaint may be taken by the intervention of some third substance, such as the air we breathe. The word *contagion* is, however, now so generally employed in both capacities that it may be well to take it here in its extended sense, and to consider the two as synonymous. Under this signification it may be said that it is of two kinds—one in which actual contact is required, with or without inoculation, and the other in which, through the medium of the air, the contagion acts upon a second individual. The former of these two varieties is called *immediate*, and the latter *mediate.* Cow-pox, hydrophobia, itch, and scall'd head, are examples of the *immediate* form of contagion; while small-pox, chicken-pox, measles, scarlet fever, hooping-cough, plague, typhus fever, puerperal fever, hospital gangrene, and possibly yellow fever and cholera, are examples of *mediate contagion.* Of course the *major* includes the *minor*—that is to say, those which are capable of being communicated by *mediate* contagion, are *a fortiori immediately* contagious. Of the nature of the matter of contagion we know nothing, and must content ourselves with attempting to discover its *laws.* In the *first place,* it is pretty generally ascertained that in either of the two modes of acting, contagion is incapable of producing its effect when diluted to a certain degree. Thus, the matter of small-pox or cow-pox, if mixed with much water, will fail in reproducing the disease when inserted in the skin; and in the same way the poisonous emanations from a patient labouring under typhus fever may be diluted with air, by ventilation, to such a degree as to prove harmless. Dr. Haygarth in the last century endeavoured to ascertain by actual experiment the least distance from the patient at which the contagion of fever produced its effect, and he came to the conclusion that even the poison of small-pox does not extend beyond half a yard in *the open air*, while typhus fever is much more limited, and in tolerably well ventilated apartments, this space is perhaps not more than doubled. Other observers think the above distance too small; but all are agreed that beyond a few feet, except in confined rooms, neither the contagion emanating from the person, nor that from his clothes (*fomites*), will operate so as to reproduce the disease. For this reason, *careful ablution* of the person, *daily change* of linen, and *liberal ventilation* are the main agents in preventing the spread of contagious diseases, and should never be neglected during their attacks. In the *second place,* it appears that any cause which reduces the health of the individual, such as *imperfect drainage*, or *close crowding*, or *bad air*, or *low diet*, or *intemperance*, will render him more likely to receive the contagion, though some of these causes also act upon the matter itself, by diluting it as before observed. *Thirdly,* there appears to be some obscure cause which *at times* makes certain diseases more rife, and more capable of communicating their nature by contagion. This is supposed to reside in the air, and to give it what is called an *epidemic constitution;* but in any case the law is well known, and the disease when thus prevalent is said to be *epidemic.* This condition is not always general, but may prevail in one locality, and avoid a neighbouring spot apparently similar in all respects. *Fourthly,* some diseases are capable of being communicated in any air whether fresh or foul, provided the matter, whatever it may be, is not too much diluted. Such are small-pox, measles, and scarlet fever; while others, such as typhus fever, are supposed to require a depraved condition of the atmosphere to allow of the matter acting. *Fifthly,* many contagious diseases, *as a rule,* make only one attack upon one individual, who is afterwards protected from their inroad upon him. Such are small-pox, measles, scarlet fever, and hooping-cough. *Sixthly,* in all contagious diseases, there is a period between the reception of the poison and the first symptom of its development during which it *appears* to lie dormant, though it is probably at work in producing its effect. This is called the period of *incubation*, and varies in different diseases; in scarlet fever it is variable, but may be said to extend from three days to three weeks; in measles it is from ten to fourteen days; in natural small-pox from six to twenty-one, and in the inoculated disease from four to eighteen; in inoculated plague about three days. Typhus-fever varies greatly, being sometimes instantly felt at the bed-side of the patient, and at others remaining dormant for weeks. Hydrophobia is supposed to incubate for a still more uncertain period, on the length of which writers on it are by no means agreed. *Seventhly*, the clothes and other articles which have either touched or been near the patient are capable of transmitting the disease when the contagion is rife, and when they are not constantly changed so as to dilute the poison. These clothes, &c., so charged are called *fomites*. *Such are the most generally received laws of contagion*, beyond which it is difficult to go without embarking on controverted points; indeed, some of the above are disputed to this day, but the evidence in their favour is in my opinion overwhelming, to say nothing of my own practical experience which fully confirms them. There is, however, one question which demands consideration, namely, whether contagious diseases are capable of being originated in other ways. It is asserted that filth will produce the itch (including, of course, its peculiar insect); but this is opposed to the present theory on the subject of spontaneous generation, which is wholly in opposition to a belief in its existence. Typhus fever is in all human probability so engendered, and is afterwards capable of transmission, of which I could adduce two or three remarkable proofs, as falling under my own experience; but small-pox, measles, and scarlet fever are not so clearly self-engendered, and the probability is that they are in the present day always due to contagion.

CONTAGION, Prevention of.—The means best calculated to prevent the action of contagious matters may be gathered from the laws which regulate it (see *last article*). They chiefly consist in the separation of the cases of each kind, mixing them if it is necessary to economise space in a hospital, so that there shall not be more than one case of the same contagious disease in one room. It is for this reason that fever seldom spreads in a *general* hospital, and that it is more fatal in one devoted to it alone. Great cleanliness, both of the person and of the body and bed linen, should be enforced, with free ventilation. The attendants should not approach unnecessarily near to the patient, and especially to the stream of air which he expires; and if obliged to touch the body, they should remain as short a time as possible consistent with a due performance of their duties, and should immediately afterwards wash themselves thoroughly, and breathe the fresh air if possible for a short time. They should also avoid all depressing elements, such as excessive fatigue, the feeling of fear as far as it is under control, intoxicating drinks, &c., and should keep their bodies in good health by a liberal diet and a daily proper amount of exercise. Lastly, the contagious matter should be submitted to the action of certain substances, of which chlorine is the principal, and which have the power of chemically destroying it. These are called *disinfectants*, and will be found described under that head.

CONTUSION.—A Bruise. This accident is too well known to need description. The best remedy is the application of the lotion given for *strains* at page 418.

CONTUSED WOUNDS, Nature and treatment of, 397.

CONVALESCENCE.—By this term is understood that period which is included between the actual termination of a disease and the time when the full health is regained. Great care is required in the more severe diseases, such as typhus-fever, small-pox, and scarlet-fever, to carry the patient through this period, as the slightest imprudence is visited either by a "relapse" into the previous condition, or by the development of some "sequel" peculiar to it. It must be remembered that in every case the secreting and digesting organs are weakened, and are, therefore, more or less unfitted to carry on their operations, although a great deal is required from them. During convalescence the demands of the appetite in particular should be guarded against, as if complied with to the full extent, mischief is almost sure to ensue, especially in children, who crave for food, often of the most improper kind, to a degree, which if gratified would nauseate and upset the stomach. The same remark applies (though not to the same extent) to exercise, which is often most difficult to commence in this climate after a long confinement to the bed-room or to the bed. The true principle is to begin by careful and small attempts, and to feel the way as it were; though in reference to carriage-exercise, it often happens that if a fine day occurs, it is better to risk the danger of "catching cold," and to allow of an invalid going out well wrapped up, even if only lately out of bed. All this, however, must be practically learned, and cannot be instilled by precept beyond the enforcement of the cautious plan of operations here alluded to. In disease of the brain, it is of the utmost importance to keep that organ idle until it has had time to recover itself, without which there is almost sure to be a relapse. These matters are, however, all enforced under the respective heads of the diseases themselves in which convalescence occurs.

CONVULSIONS in the adult occur in several diseases, and are of several kinds. They are defined as consisting of "violent and sudden involuntary contractions, attended with relaxations of the muscles of the body." These are called *clonic* convulsions; while, when they are more persistent, and the relaxations do not soon follow or alternate with the contractions, as in *tetanus*, they are said to be *tonic*. They are sometimes *general*, and at others *partial*; sometimes evidently symptomatic of well-known diseases, while at others they may be considered as in themselves constituting a distinct form. When general, they are either the immediate precursors of death from severe disease of the brain or other parts of the nervous system, or they form the outward sign of various diseases, as *Epilepsy*, *Hysteria*, &c.

CONVULSIONS, *when partial*, occur as *symptoms* of the following conditions. Sometimes there are slight convulsions or spasms of the muscles of the eye or eyelids, which generally depend upon some trivial congestion of the brain arising from a surcharge of bile or urea in the blood. Again, we find occasionally the muscles of the face convulsed, giving rise to a most disagreeable suspicion of laughing in the face of the person opposite, and generally being a symptom of organic disease of the brain of the kind known as "softening." Convulsions of the limbs, when they extend beyond ordinary "cramp," which is rather considered to be spasm than convulsion, are of the kind known as "tetanic," and are the symptoms either of tetanus itself, or of the effects of nux vomica, strychnine, and brucine; or they occur in children, and are the signs of irritation of the nervous system. See *Convulsions of Children*.

CONVULSIONS in New-born Infants, Treatment of, 278, 280.

CONVULSIONS of Children, nature of, 86, 286; treatment of, 287.

CONVULSIONS, Puerperal, symptoms of, 169; treatment of, 505, 506.

COOKERY.—See *Invalid Diet*, 17, 246; also *Nursery Diet*, 290.

COPAIBA, Balsam of, 231.

" Nettle-rash produced by, 61.

COPPER, Sulphate of, 231; symptoms of poisoning by, 174; treatment of poisoning by, 509.

CORDIALS are warm tinctures, composed of alcohol and various essential oils, spices, &c. They stimulate the circulation through the nerves; and their effect lasts longer than that of alcohol alone, leaving less depression also as a consequence of their cessation. The best French brandy is one of the most useful which we possess.

CORIANDER SEEDS, 231.

CORNEA.—The transparent membrane or "coat" set in the front of the eye like a watch-glass in its case. See *Eye*, *Anatomy of.*

CORNEA, Ulceration of the, 163; treatment of, 490.

CORNS, Nature of, 72; treatment of, 391.

CORNUS CIRCINNATUS.—The round-leaved cornell is sometimes used in the shape of a tincture, as a warm stomachic, and for worn-out constitutions or delicate stomachs is a most excellent remedy. The dose is one tea-spoonful, and it is sold by Mr. Reece, the chemist, of Piccadilly.

CORROSION.—The rapid chemical destruction of any substance. In the living body it is applied to the destructive action of those substances, such as the mineral acids, caustic potass, corrosive sublimate, &c., on the parts with which they are brought in contact.

CORROSIVE SUBLIMATE, Symptoms of poisoning by, 173; treatment of poisoning by, 509.

CORYZA.—Synonymous with "cold in the head." See *Catarrh*, 47.

COSMETICS.—Many substances which are used to add beauty to the skin are included under this title; some are innocent, while others are ultimately very injurious to the skin; and even to the general health. Rouge has this effect to a great extent, turning the skin yellow, and necessitating that yearly increasing application which renders it so unpleasant to the eye in those who have long used it. Many of the more simple washes, such as elder-flower water, rose-water, Hungary-water, and other such vegetable infusions, whether distilled or not, are wholly innocuous.

COSTIVENESS.—See *Constipation* and *Cathartics.*

COTTON.—The well-known fibre obtained from the cotton-plant. It is particularly well adapted for the clothing of man, being cheap in production, easily manufactured, and warm, whether wet or dry. See *Clothing.*

COTTON, Carded (otherwise *medicated*) is dressed so as to be free from all impurities. See 265, and the treatment of *Burns* and *Rheumatism.*

COTYLEDON UMBILICUS.—A British plant which has been introduced into notice as a cure for epilepsy, by Mr. Salter, of Poole, who has published some successful cases in proof of its efficacy. I certainly have not seen any good effect myself; but I have only tried it in a few cases of the disease. The dose of the pure juice is from half an ounce to an ounce two or three times a day.

COUCHING.—The operation of depressing the lens in *cataract.* See *Treatment of Diseases of the Eye*, 490.

COUGH.—A symptom of catarrh, 47; influenza, *ib.*; laryngitis, 48, 51; bronchitis, 48, 49; hooping-cough, 49, 50; croup, 51, 52; pneumonia, 76; pleurisy, 79, 80; phthisis, 135.

COUGH, Treatment of, in catarrh and influenza, 370; in laryngitis, 371; in bronchitis, 373 *et seq.*; in infantile bronchitis, 303; in pneumonia, 406; in pleurisy, 410; in phthisis, 470.

COUGH MEDICINES.—See *Expectorants*, 345, and the above subjects.

COUNTENANCE, Anxiety of.—A symptom of functional or organic disease of the heart, also of any disease which impedes respiration, such as pneumonia or severe bronchitis, laryngitis, or croup, or the last stages of consumption, or dropsy of the chest, when existing to an extent sufficient to press severely upon the lungs, or empyema, melancholia, and hypochondriasis. Sometimes also it is seen in low forms of mania to a certain extent, but not nearly so much so as in the above named diseases. Anxiety is shown in fevers and all acute diseases which endanger life.

COUNTENANCE, Livid and turgid with blood.—This is a symptom peculiar to impeded respiration and circulation and congestion of the brain. It occurs only in apoplexy, 118, diseases of the heart, 144, epileptic fits, 147, and in all conditions of the lungs in which respiration is much impeded, especially in the state of *effusion.* See *Death Rattle.*

COUNTENANCE, Pale.—A sign of fainting, 116; of anœmia, 132; of hemorrhage, 145.

COUNTENANCE, Excited expression of.—A symptom of delirium in fever, 24; of some forms of mania, 151; of delirium tremens, 117; and of inflammation of the brain, 120.

COUNTENANCE, Distortion of.—A symptom of paralysis, 125; convulsions of various kinds (see *Convulsions*); epilepsy, 147; hysteria, 148; and chorea, 150.

COUNTENANCE, Flushed, is symptomatic of fever in general, including that attending on all severe inflammations; also of the early stage of delirium tremens, 117.

COUNTENANCE, Hippocratic.—In the last stages of many diseases, the face assumes a peculiar shrunken appearance, which has received the name *facies Hippocratica,* and which is rarely followed by recovery. Professional nurses are so well aware of this aspect, that they say the patient is "struck with death." It is somewhat difficult to paint in words, but once seen is easily afterwards recognised. The following is the description given by Hippocrates himself:—"The forehead wrinkled and dry; the eye sunken; the nose pointed and bordered with a black or violet circle; the temples sunken, hollow, and retired; the ears sticking up; the lips hanging down; the cheeks sunken; the chin wrinkled and hard; the colour of the skin leaden or violet; the hairs of the nose and eyelashes sprinkled with a yellowish white dust."

COUNTER-IRRITATION, 261, 262.

COUP-DE-SOLEIL.—See *Sun-stroke.*

COW-HEEL, Suitable for invalid diet, 248.

COW-POX, Nature of, 33; casual in the cow, 34; identity with small-pox, *ib.*; Bryce's test for, 36.

COW-POX, Vaccination for, 267 treatment of, 300.

CRAB (see *Shell-fish*), Poisoning by, 175; treatment of, 510.

CRAB'S EYES.—An exploded mode of using carbonate of lime in medicine.

CRANIUM (*the upper part of the skull*).—It consists of eight separate bones. Four single ones—the *frontal, occipital, sphenoid,* and *ethmoid*—and two pairs, the *parietal* and *temporal* bones. These together form a large oval cavity entirely occupied by the brain, which extends downwards to the level of the eyes and external ear-passage. It has one large opening in the occipital bone, through which the spinal cord passes, and several small ones (*foramina*), which give exit to the cerebral nerves and veins, and entrance to the arteries of the brain. The bones of which it is composed are only capable of being separated in youth, being closely united, and either partially or entirely joined together by ossification, after the age of twenty-one. The cranium is attached to the trunk by the vertebræ of the neck, with the two highest of which it is articulated by a most beautiful joint allowing of a hinge-like action, as well as of rotation on the axis of the body, without which we must always look straight before us, and could never turn the head over the shoulder.

CREASOTE, Properties and effects of, 231, 232; ointment of, 239.

CRISIS.—A definite period in the course of a disease, in which there is a decided change for the better or the worse. It has, from the earliest

days of medicine, been remarked that this is more likely to occur on certain days of fevers, which run a regular course, than on others, and hence they are called *critical days*. See 27 (*par.* 73). In chronic diseases particular symptoms are also said to be *critical*—that is to say, they are supposed to mark an alteration in the condition of the system, and a probability of the complaint getting better, or the reverse. Thus, in the hydropathic treatment, the production of boils by the constant excitement of water is said to be *critical*.

CROTON-OIL.—A very active purgative oil, obtained from *croton tiglium*. The dose is one drop, but it should only be employed on the greatest emergency, and when ordered in the previous pages. See *Colic*, *Apoplexy*, &c.

CROUP, Symptoms of, 51; treatment of, 304, 305.

CROUP, Spasmodic, symptoms of, 52; treatment of, 305.

CRUSTA LACTEA.—A scabbed eruption of the cheek peculiar to childhood. See *Eczema*, 63; and treatment of, 383.

CRYING of a New-born Child, 276.

CRYSTALLINE LENS.—See *Eye, Anatomy of.*

CUBEBS.—The dried unripe berries of the *piper cubeba*. They possess a stimulant specific power over the urinary organs, and are used in several congested and inflamed conditions of the bladder and urethra. The dose being from ten to fifteen grains of the powder.

CUMIN SEEDS.—The fruit of *cuminum cyminum* possesses aromatic and stimulant properties; but it being somewhat more disagreeable than other drugs, it is not now much used in medicine.

CUPPING, Object and method of performing, 260.

CURD.—The albuminous portion of milk coagulated. It is naturally effected in the human stomach before digestion, and very completely in that of the Infant. For making cheese the decoction of the calf's stomach called "rennet" is employed to make the curd, but all milk when sour separates into the curd and the whey. See *Coagulation*.

CURRANT DRINK, Black, 250.

CURRANT WATER, Red, 250.

CURVATURES OF THE SPINE, Symptoms of, 139; treatment of, 428.

CUT.—See *Wounds*.

CUT THROAT, Treatment of, 513.

CUTANEOUS.—Relating to the skin.

CUTANEOUS DISEASES, Symptoms of, 57 *et seq*; treatment of, 381 *et seq.*; in the new-born infant, 278; in the child, 310.

CUTICLE.—The scarf-skin, 45.

CYANOSIS (*Blue Disease*), 377.

CYDER is the fermented juice of the apple, as perry is of the pear, both being treated alike in their manufacture, and resembling one another in their effects, except that some kinds of perry are diuretic. For the purposes of making the two drinks, the fruit in either case must be of a very different quality from those intended for the table, which are luscious, and almost entirely devoid of the astringent properties which are required for keeping the juices of those intended for cyder and perry. This astringency is mainly due to the tannin contained in the fruit, which leaves a most unpleasant sense of roughness on the palate. It is very difficult to make these two drinks from sweet fruit, and almost impossible without an admixture with some of those containing the astringent principle, though some makers, even with the former, contrive by careful and often-repeated racking to stop the acetic fermentation, and keep the saccharine matter in its original state. The conversion into pulp is the first part of the process, which in the old methods was a very long one, and, with the aid of a very clumsy stone-mill worked by a horse, extended over a long period of time, seldom being completed before Christmas, during which time half the apples became rotten. At present, as soon as they are gathered, or within a few days after, a portable machine is hired by the grower and worked by its owner at so much per hogshead; most of them being able to grind and press eight or ten hogsheads a day of 100 gallons each, or a proportionate number of those containing fifty-four gallons. In the Worcester and Hereford districts, the former measure is adopted, while in the western counties the ordinary beer measure of fifty-four gallons is the hogshead employed. These machines tear and grind the apples to pieces either with the aid of horse-power, requiring three or four horses, or by steam, the last being seldom employed. The mill is of steel, and acts not by mere pressure, as in the old stone-mill, but by the ordinary action of grinding. The pulp thus prepared is at once pressed, being placed, as in the old press, in horse-hair bags, and then squeezed by hand-labour, the juice running out, being in the condition of new cyder, ready to to be at once moved down into the cellar. After all the apples are ground and pressed, the pulp is mixed with water, re-ground and repressed, and makes about a tenth of the original quantity of a liquid which is called "water cyder," and which must be soon drunk, because it will not keep, though sweet and agreeable to the palate for a short time. . On being stored, the new cyder soon begins to ferment, seldom requiring any aid for that purpose, as in the case of malt-liquor. Sometimes, however, when it refuses to work, a little yeast, say about a pint, is stirred into a hogshead of cyder, and that very seldom fails to set it going. Generally, in twenty-four hours, a scum begins to rise, which should be carefully removed as fast as it makes its appearance. The cyder is either temporarily left to ferment in large vessels set on end with their heads out, or else it is at once poured into the casks where it is to remain, according to the peculiar methods practised in different localities. If the large upright casks are used, the cyder is only allowed to remain in them for thirty-six or forty-eight hours, when, if the fermentation has caused the cyder to throw down a considerable amount of its mucilage in the shape of flocculent matter, it is at once racked into the store-casks, and there the fermentation is allowed to progress to a certain point, which varies greatly with the particular kind of fruit, and which can therefore scarcely be described. The bung-holes are kept filled up with cyder of corresponding age and quality, and thus the working froth is caused to flow over every time the new fluid is added. After a certain time, when the fermentation is considered to have proceeded far enough, the cyder is racked again into another cask, which stops the fermentation for an uncertain period, and on its again re-appearing, recourse is had to a third, or fourth, or even a fifth, racking. So careful are some of the best cyder-makers to catch the exact moment when this new attempt at fermentation shows itself, that they will sometimes sit up all night rather than allow the proper moment to slip by without taking advantage of it. Some growers boil their cyder for the purpose of stopping the fermentation, others use the fumes of sulphur for the same purpose; but the best sweet cyder, which is always that in which the process has been stopped, is generally made by attending carefully to the racking-process. The quality of both cyder and perry varies very considerably, there being every grade, from sweet to sweet-and-rough, rough-without-sweet, and rough-and-acid descriptions. Much of this is due to the soil, for some soils will not produce any thing but rough and sour perry and cyder. Still more in general depends upon the manufacture; and the careful grower will often, by a few hours' attention per week, double the value of his stock. Both require some time to accustom the stomach to the presence of the acid which they contain.

CYDER, Bottled.—Both cyder and perry are bottled; they are brisk, and full of carbonic acid gas, and often greatly admired as a substitute even for champagne. No precaution is necessary but to bottle the one or the other in strong bottles with good corks, and not to delay this too long; though at the same time it is necessary to avoid attempting to confine either cyder or perry before the fermentative process is settled, or the strongest bottles will be burst. They are both wholesome drinks when free from adulteration, and taken by a stomach accustomed to the presence of *malic, occasionally mixed with acetic, acid.*

CYNANCHE MALIGNA.—See *Scarlet Fever.*

CYNANCHE PAROTIDŒA. — See *Mumps.*

CYNANCHE TONSILLARIS, 108; treatment of, 453.

CYNANCHE TRACHEALIS. — See *Croup.*

CYSTITIS (*Inflammation of the Bladder*), Symptoms of, 56; treatment of, 380.

DALBY'S CARMINATIVE.—A useful quack cordial, extensively employed in infantile disorders of the stomach and bowels, 269.

DAMP, Effects of.—These are manifested in the most disagreeable way whenever we live in damp situations or houses, or lie in damp sheets, or put on damp clothes. It is difficult to explain the action of damp upon the frame; for it is not mere loss of temperature which produces the ill effects, inasmuch as we find a much lower degree of cold will have no injurious tendency. But let the principle be what it may, there is no doubt of the fact, that, except in the very hardy, damp applied in any of the above ways is extremely likely to be followed by rheumatism, or by what is called "catching cold." Indeed, this is so generally admitted, that the first thing a person of any experience looks at in the walls of a house he is about to take, is the question of damp; and, if present, he is sure to reject it, not only because it destroys his furniture, but because he believes it to be unhealthy; and next to the walls, he regards the situation with distrust if it appears inclined to be damp. It is somewhat probable that a great deal of the injurious effects following the occupation of damp houses is owing to its being generally accompanied by imperfect ventilation, which is admitted to be in itself prejudicial; for the mere presence of moisture is not by any means sufficient to account for the depressing influence of a damp house or a damp situation. It is, I believe, the vegetable decay going on, without the dispersion of its emanations by the admission of a thorough draught, which does the mischief; and I much doubt whether an iron house in the same position would be unhealthy, if made sufficiently warm by building it with double walls. Damp sheets, no doubt, act by the rapid cooling of the skin which they produce, and the same applies to damp body linen. But it is not a little singular, that if, instead of applying a damp sheet for a few hours, as often happens among careless chambermaids, it is more thoroughly wetted, and more blankets put on, a reaction takes place, which has not the same tendency to give cold. For those who suffer from the effects of these sheets, the best remedy is a fine flannel bag to tie round the waist, or even round the neck, and enclose the whole body; and, with this precaution, the sheets must be absolutely wet to do any harm.

DANDELION (*leontodon taraxacum*).—The well known plant so common in this country. In France the leaves are used with many others in making their salads, but in this country the roots only are employed, and they are only taken medicinally, being sometimes mixed with coffee, and at others taken as an infusion or as a decoction; which last is, in my opinion, the best preparation if not over-boiled—that is to say, taking care only to simmer it.

DANDELION, Decoction of, 232; extract of, 233.

DANDRIFF.—Scurf of the head, 71; treatment of, 390.

DAWLISH.—A watering-place in the south coast of Devonshire, well protected from the winter cold, but too damp for other seasons. See *Climate.*

DEADLY NIGHTSHADE (*belladonna*), Symptoms of poisoning by, 176; treatment of, 511.

DEAFNESS, Nature of, 164; treatment of, 490.

DEATH, Signs of.—Life, as far as we know, consists in some principle by which the particles of our body are kept from decay by the ordinary laws of nature; and death, being the cessation of life, is a permission given to these laws to work their will. Hence it results, that the most certain sign we possess of the occurrence of death is the commencement of putrefaction; and until that sign is clearly visible, no one can demonstrate the fact of death having taken place, however probable he may think it from the results of his previous experience. It may be true, as has been asserted by Dr. Paris, "that it is physiologically impossible for a human being to remain more than a few minutes in such a state of asphyxia, as not to betray some sign by which a medical observer can at once recognise the existence of vitality;" and for myself, I should have no hesitation in acting upon the belief, but at the same time, there are scores of recorded instances in which death has been supposed by the medical attendant to have taken place, but in which a partial or total recovery has followed, after an interval of some hours. Much will depend upon the nature of the disease which the patient was attacked by, for it often happens that death takes place under such circumstances as to make it physically impossible that life could continue much longer, even if it had not happened as it did, and here, of course, the probability is heightened; but still positive proof is not obtained within the time necessary for putrefaction to commence. For these reasons, it is always a satisfaction to the friends, if interment is postponed long enough, to admit of this proof, and excepting in the case of contagious diseases, it ought always to be adopted. Next to putrefaction comes the stiffness of the limbs, which takes place as soon as the body becomes cold; but this may possibly be the result of freezing, or of convulsions, and it does not makes its appearance in death from lightning, but in all other kinds of death is an invariable sign. The *coldness of the whole body* is a pretty sure test, and if in our temperate climate it reaches exactly the same degree as the surrounding air, death may be concluded to have taken place, with a moral certainty, if not with physical proof. The cessation of respiration and circulation are also reliable signs, as observed by Dr. Paris (previously quoted); but there is no actual proof that, in the instances which are recorded, the suspension of these functions was not as perfect as it has been asserted to have been. At all events, the opinion of a competent authority ought to be taken, before it is concluded that life is extinct.

DEATH, Causes of.—*When a person is found dead, or apparently so*, it becomes important to discover, in the first place, whether life is really extinct, and in the second, the cause which has led to its extinction. By attending to the signs given in the last article, the former of these points may be ascertained with something like certainty, but we have now to consider the latter. Death may be caused either by a cessation of the action of the *heart*, or of the *lungs*, or of the *brain*, or by the *whole body* wearing out together; but sudden death only occurs from the three first. Thus, 1st, exhaustion from hemorrhage or other loss of fluid, or spasm, or organic disease, or particular poisons, may deprive the heart of power to act, and death may take place, accompanied by fainting; or, 2nd, the action of the lungs may be stopped altogether by convulsions of their muscles, or by drowning, or hanging, or strangling, or by the breathing of steam, or pure carbonic acid gas, or any other gas than atmospheric air; or, 3rd, pressure on the brain from apoplexy, or extravasation from accident, or severe concussion or compression; or the action of certain poisons on the nervous system, including all the anodynes and stimulants, may destroy life. In most cases of death from the first and last causes, the senses are in abeyance for some short time before death takes place, unless it is very sudden; but in the second set of cases they are often preserved until they are interfered with by the circulation of black blood in the brain. Whenever a body is found dead, the person who first sees it should carefully note the position in which it lies and all the attendant circumstances, as in case of its being the result of violence, the most trivial facts often lead to the detection of the murderer.

DEATH RATTLE.—In most lingering deaths, there is towards the last an effusion of a frothy mucus into the bronchial tubes, which at first is brought up by coughing, but in time causes suffocation, from a want of power in the system to get rid of it in this way. It always occurs when disease of the lungs is the cause of death, excepting where there is great exhaustion, and then life may be rendered extinct from a cessation of the action of the heart, before the effusion takes place; and this is especially the case when there is a hemorrhage from the lungs.

DEBILITY, or *weakness*, is a symptom consequent upon all acute diseases, and partially so upon most of those which are chronic. Sometimes it is apparently out of all comparison with the disease which it follows, and then it is usual to describe it as *nervous debility*, by which, it is true, we are not much enlightened. Fevers and disorders of the digestive organs cause the greatest degree of debility and in the shortest time; and a "bilious attack" of two or three days' duration will often reduce the strength of a healthy man to such an extent as to prevent his standing or even sitting upright. Mere muscular debility unaccompanied by fainting, from a weakness of the heart, may be disregarded so far as to allow the patient to use his own discretion *after its cause is removed;* but when there is a tendency to fainting, and the heart's action is in a doubtful state, the greatest care must be exercised lest the slightest exertion, or even a mere sitting up in bed, should bring on a fatal attack. Many individuals die in this way when apparently recovering from acute diseases, who would in all probability preserve their lives if they were kept for a few more days in the recumbent position, to give the heart and its servants (the organs of digestion) time to recover.

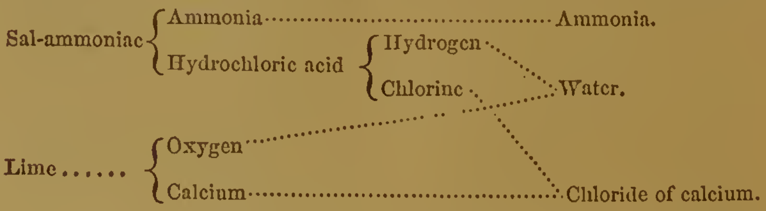
DECAY.—See *Age* and *Disease.*

DECIDUOUS MEMBRANES.—Two layers of membrane which line the uterus during gestation, one attached to its inner surface which remains behind at the birth of the child to be expelled piece-meal, while the other comes away with the afterbirth.

DECLINE.—A term used in common language to signify lingering death either by pulmonary consumption, 135, or by disease of the mesenteric glands, 137.

DECOCTION, Nature of, 232; decoction of aloes, *ib.*; decoction of barley, *ib.*; compound decoction of barley, *ib.*; decoction of cinchona, *ib.*; decoction of dandelion, *ib.*; decoction of dulcamara, *ib.*; decoction of Iceland moss, *ib.*; decoction of logwood, *ib.*; decoction ot oak bark, 233; decoction of poppyheads, *ib.*; decoction of quince seeds, *ib.*; simple and compound decoction of sarsaparilla, *ib.*; decoction of starch, *ib.*

DECOMPOSITION.—A chemical operation which can only be explained by the knowledge of the fact that certain substances have a greater affinity for certain other substances than anything else; and, consequently, if A meets with B C in combination, and has a greater affinity for B than they have for each other, a "*decomposition*" takes place, and A B form a new substance, while C is set free. Sometimes a much more complicated operation takes effect, as when two or more substances meet in which there is a varying affinity in their several component parts. Here a curious cross-exchange of materials is accomplished, and an entirely new set of salts is the result. Thus, supposing quick-lime and sal-ammoniac are brought together, the following will be the decompositions and re-unions, expressed in the annexed diagram:—



Here, then, we have ammonia disengaged, while the chlorine unites with the calcium, for which it has a greater affinity than for any other substance in the mixture, and in doing so it leaves its own hydrogen, with which it formed hydrochloric acid, to unite with the oxygen of the quick-lime in the shape of water. The result, therefore, is, that upon two *dry* powders being brought together, a gas (ammonia) is evolved, while a *wet* chloride of lime, with a portion of *hydrate* of lime in addition, are left behind.

DEFORMITIES.—See treatment of curvatures of the spine, 327; also club-feet, 428; and permanent muscular contractions, 429.

DELIRIUM TREMENS, Symptoms of, 117; treatment of, 457, 458.

DELIRIUM, or *Wandering*, occurs as a *symptom* in many febrile diseases; but as it is liable to be confounded with *mania*, it will be first necessary to ascertain its nature. In practice there is little or no difficulty in distinguishing between the two, for the presence of fever in the one case, and its absence in the other, is generally sufficient to serve as the means of diagnosis; but sometimes in mania there is also fever, and then this sign does not serve, so that we are compelled to resort to some more accurate method. We find on closely examining the two conditions, that, in *delirium*, all the functions of the brain are implicated—there are no correct sensations, connected ideas, or passions, no regular voluntary motions, little or no intelligence, an almost entire loss of memory *when called upon;* and the patient lies in a land of his own imagination, talking to creatures of his own brain. On the other hand, the insane have generally possession of their *external* senses and of voluntary power—they see, hear, taste, and smell, and very often the disease is confined to a single faculty (*monomania*); while in those in whom the most intense maniacal affections are developed, the faculties appear to be perverted, but are not lost, since the most irrational maniac talks, reasons, and wills, and though his premises are absurd, yet he argues well from them. With this definition of the nature of febrile delirium, we may now consider in what disease it occurs as a *symptom*. *Firstly*, in all *continual fevers* it is liable to occur, though in slight cases of *simple fever* it is generally absent. In *typhus fever* it is almost always present, whether the head is the seat of complication or not, 25. In *peri-*

odic fevers it is also met with, though often absent in mild cases of *ague*, and generally in *gastric remittent*, 28. In *yellow fever* it is always present, and also in *infantile remittent fever*, 29. In *hectic fever* it is not often met with, until quite the closing scene, when the brain suffers from a supply of impure blood, 30. In all the severe forms of *eruptive fevers* there is delirium, being absent in *cow-pox*, generally in *chicken-pox*, and in the mildest attacks of *modified small-pox*, as well as in *miliary fever* in most instances, but not always. In the inflammatory fever which accompanies *erysipelas*, and also most of the severe forms of internal inflammation of the various organs, delirium is more or less marked, while in those of the *brain* it is particularly prominent, 44.

DELIVERY, Management of, 497 *et seq.*; treatment after, 501 *et seq.*

DEMULCENTS (*soothing medicines*).—These constitute a class of medicines which are locally applied to the skin or mucous membrane, upon which they act chiefly by affording a bland kind of sheath to protect them from the irritation of the matters coming subsequently in contact with them. Thus, arrowroot and starch have this effect, in common with sago, tapioca, &c., as well as the various emulsions made with egg or almond. Linseed-tea is an excellent demulcent, and is largely used in irritation of the bladder, its qualities appearing to be absorbed and conveyed through the urine to the interior walls of that organ. The mixture of gum-arabic is also supposed to have the same effect, and also to a certain extent the decoctions of liquorice and marsh-mallow. Gelatine and isinglass are the best animal demulcents, and when added to milk they exercise this property very beneficially.

DENTIFRICE.—Tooth-powder. In all cases the dry ingredients should be finely powdered and well mixed. Some of them are usually *levigated*—that is, ground with water. Those powders which contain acids should not be frequently used, especially when the enamel is thin. For children those only which contain very soft powders should be employed, such as (*b*) or (*c*). That under (*a*) is the most generally useful for adults, while (*d*) can only be safe when there is a great accumulation of tartar, and the enamel is thick.

(*a*) Take of flowers of sulphur and prepared chalk, of each, one ounce; Armenian bole and powdered myrrh, of each, one drachm. Mix. (*This is a highly preservative powder*).

(*b*) Charcoal, one ounce; Peruvian bark, half an ounce; oil of cinnamon or mint, two drops; essence of ambergris, thirty drops.

(*c*) Charcoal, one ounce; sulphate of quinine, two to four grains; magnesia, five grains; any essential oil, two drops. Mix.

(*d*) Myrrh, one ounce; cuttle fish-bone, four ounces; orris root, three ounces. Mix.

DENTITION, Progress of, 92, 93, and 285, 286; diseases of, and their treatment, 286, 287.

DEOBSTRUENT.—This term is now seldom used in medicine, but was formerly employed to signify the power of removing obstructions.

DEPILATORY.—A drug or other application, which has the power of removing superfluous hairs from the skin. Quick-lime is the basis of all those which are at all effectual, and if used with great care it can do no great injury to the skin, and is otherwise quite harmless. Those which contain sulphuret of arsenic (orpiment) are very poisonous, and should on no account be employed. In using either of the following powders, they should be mixed with water as they are wanted, and the powder itself should be kept in a well-stoppered bottle:—

(*a*) Mix quick-lime and water to a thick cream, and pass through the mixture about thirty times its volume of sulphuretted hydrogen gas. As soon as the gas begins to escape, stop the process. Spread the pulpy mass on paper, and apply it for about a quarter of an hour, then wash all off with a sponge. It is a very effectual remedy, but dreadfully offensive to the nose.

(*b*) Take of quick-lime, one ounce; carbonate of potass, two ounces; charcoal powder, one drachm. Mix, and keep in a well-stoppered bottle. It should be formed into a paste as wanted, and used like (*a*).

(*c*) Take of quick-lime, eight ounces, pearl-ash, one ounce; flowers of sulphur, one ounce. Mix, and use like (*a*).

(*d*) Make a saturated solution of sulphuret of barium, and form into a paste with powdered starch as it is wanted. Use like (*a*).

DERBYSHIRE NECK, or *Bronchocele*, Symptoms of, 109; treatment of, 454.

DERIVATIVES are medical agents which act on the same principle as *counter-irritation* (which see). It is a term now seldom used.

DESQUAMATION is the term applied to any unusual scaling off of the cuticle, such as happens after the eruptive fevers, and particularly after *scarlatina*, in which the cuticle comes off in large patches. It also happens after *erysipelas*, and to a certain extent *measles* and *roseola*.

DIABETES, Nature and treatment of, 451.

DIACHYLON PLASTER.—An *adhesive* plaster which is solely intended to keep divided parts in apposition and to protect them from the air. In order to make it sufficiently adhesive, it is made with a certain admixture of resin, the consequence of which is that it is too stimulating for delicate skins, and when used to them it produces suppuration and inflammation, instead of the adhesive form or "union by the first intention," 42.

DIAGNOSIS.—The art of distinguishing between different diseases so as to enable the observer to detect the nature of the one before him. See page 21. In carrying out this art into practice by the aid of the present volume, it is only necessary to take the most prominent symptoms and look them out in this part, when it will at once be seen in what diseases they occur, and then by turning to each of these in their turn, a pretty good *diagnosis* may be arrived at by any careful observer. It is, however, necessary to observe that *all the symptoms* should be examined into before any conclusion is arrived at, for very often the omission of one or two will make all the difference in the soundness of it.

DIAPHORETICS are medicines and other agents which produce an effect on the skin, so as to increase the amount of blood in it, and the secretion from it of perspiration, 191, 348.

DIAPHRAGM, or *Midriff*.—A thin muscle which forms the separation between the abdomen and chest. It is arched in all directions, with the convexity upward, and is attached around its circumference to the spine, ribs, and breast-bone. The centre of it is a thin layer of tendon upon which the heart lies, and this part does not move much during the contractions of the muscular fibres, being held in its place by stays from above, which act upon it through the medium of the fibrous *pericardium*. From this peculiar arrangement, the heart is not made to move up and down, which it otherwise would be, since it lies with its right side flat upon the central portion, and if this descended into the abdomen during the act of inspiration, the heart must fall also, the contrary taking place in expiration. Thus, in reality, the diaphragm during life is not formed like a cup; but if viewed from the front, the section would have a double curve or convexity with a central portion nearly flat; but as the lungs lie on each side, and do not occupy the middle, the alteration of this curve on each side is sufficient to act very considerably upon them, and, when aided by the elevation of the ribs, to cause the cavity of the chest on each side occupied by the lungs to enlarge, so as to draw in an amount of air sufficient for each respiration. There

are three principal openings in this great *septum*, one occupying nearly the middle, but a little to the right side, through which the large vein enters the heart from below (*vena cava ascendens*); another behind this, but a little to the left, through which the *œsophagus* or *gullet* passes to the stomach; and a third, close to the back-bone, where the great artery (*aorta*) passes downwards to supply all the lower half of the body.

DIARRHŒA, Symptoms of, 52; treatment of, in infants, 283; in children, 306; in adults, 376 *et seq.*

DIASTOLE.—The dilating action of the cavities of the heart. See *Heart.*

DIATHESIS, Definition of, 3; the gouty, 87; the rheumatic, 88; the scrofulous, 134; the hysterical, 148.

DIET.—See *Food*, 13 *et seq.*

DIET, Invalid, 17, 246, 247, 249, 250; Nursery, 290.

DIGESTION, 153, 154. See also *Assimilation.*

DIGITALIS (*fox-glove*), 233; symptoms of poisoning by, 177; treatment of poisoning by, 511.

DILL WATER, 233.

DILATATION of the Bronchi occurs sometimes in *chronic bronchitis*, apparently from the violent expulsive efforts in coughing acting upon the air confined within them during the partial closing of the laryngeal opening. It is apt to lead to mistakes in young stethoscopists, who are misled by the resonance which is given out by the voice from them into the belief that a cavity or vomica exists.

DILATATION of the Heart.—This is an organic disease which is not likely to be made out by the domestic observer, and is therefore omitted from the first and second Parts. It arises from over-distention, which again is usually brought about by congestion of the liver or lungs, or by some defect in the valves of the heart, so that they do not act. The dilatation may occur without increase of substance, which is called *simple dilatation*; or with an increase, when it is said to be complicated with *thickening of the walls*, or with an *absolute thinning of the walls*, which is attended with great feebleness of pulse and difficulty in carrying on the circulation. When the substance of the heart is thus enlarged, it is said also to be *hypertrophied.* In any case the only thing which can be done in the way of *domestic treatment* is to keep the heart as quiet as possible, by avoiding all unnecessary excitement of either body or mind.

DILUENTS are medicines which dilute the fluids of the body, but the foundation of all of them is pure water. See *Diuretics*, 191.

DINNER.—The principal meal of the day, but somewhat difficult to define in any other way; since that which is the dinner of the lower classes is the luncheon of the rich man, and his dinner again is the supper of the former.

DINNERS of Children, 291.

DISCHARGE.—A term used somewhat loosely in medicine and surgery to denote any secretion, but more particularly an unnatural one; thus, *pus* or the matter of abscesses is a *discharge*, as also is that from the nose in "a cold," or from the bowels in diarrhœa and dysentery, &c.

DISEASE, General principles for the removal of, 1 *et seq.*; definition of, 1; influence of temperament on, 2; diathesis and idiosyncrasy, 3; climatic and epidemic influences on, 4; the elementary forms of, 19 *et seq.*; nomenclature and classification of, *ib.*; the causes and symptoms of, 21; the various methods employed for the removal of, 178 *et seq.*; orthodox principles of treatment adopted in the removal of, 182 *et seq.*; homœopathic principles, 192 *et seq.*; hydropathic, 201 *et seq.*; kinesipathy employed for the removal of, 209; quackery and other popular fallacies, 214 *et seq.*; practical application of the principles of the healing art to, 219 *et seq.*; domestic surgical appliances to, 256; treatment of children subject to, 268 *et seq.*; the art of prescribing for, 339.

DISEASES of parasitic animals, 157,

486; malignant, 160, 487; of the eye, ear, &c., 161, 488; of women, 167, 495 *et seq.*; of adults, 337; inflammation of the mucous membrane and the skin, 369 *et seq.*; of the cellular and serous membrane, 404, 409; of fibrous inflammation, 413; of fractures of the bones, 429; inflammation of the glands and absorbents, 441; of the brain and nerves, 456, 480; of the blood, 131, 467; of the digestive organs, 153, 483; from the effects of poison, 507; fevers, 23, 41, 350 *et seq.*; congestion and inflammation, 41 *et seq.*; vesicular, 61; of the nervous system, 147; arising from suffocation, 512; incidental to sea voyages, 513.

DISINFECTION.—See *Contagion*.

DISINFECTANT. — Certain substances have from the earliest ages been invested by mankind with the power of preventing the influence of contagion upon those who are submitted to it. Under the article on *contagion*, it has been asserted that a free ventilation is the best disinfectant; but beyond this there are also some other chemical means of absolutely destroying the virulence of the material of which the contagious *fomites* are composed. The old-fashioned fumigations with aromatic substances are now proved to be inert, and camphor, benzoin, cascarilla, pastilles, &c., &c., are replaced by the use of three substances only, upon which reliance is now placed with some degree of certainty. These are *charcoal*, *quick-lime*, and *chlorine* (the last being either combined with *lime*, *soda*, or *zinc*, or in a *free state*), and also the agency of a *high temperature*.

(*a*) *Charcoal* possesses the property of absorbing gases, and in this way most probably acts upon the contagious principle, whatever it may be. In malarious districts, or in those situations where collections of decomposing matter are likely to be prejudicial to health, there is every reason to believe that a liberal use of vegetable charcoal in powder is very efficacious. So also charcoal used as a filter for water appears to remove any noxious gases by absorbing them. *Peat charcoal* is the best for this purpose.

(*b*) *Quick-lime* absorbs carbonic acid, and probably other gases very rapidly, and is, therefore, used to cover decomposing animal substances, which give them out freely. In this way, and with this view, it is employed in the course of epidemics to prevent the emanations from privies, &c., arising and doing mischief. It also, when washed over the walls, removes any foul gases adhering to them or contained within their crevices. When used, it should be *fresh* and not the slacked lime, which is so frequently employed, with little or no effect.

(*c*) *Chlorine* is seldom used in its gaseous condition, but its combination with lime and zinc is of such a nature that it is slowly given off by these substances, when in solution. If, however, it is desired to disinfect a house in the most powerful mode, chlorine in its gaseous form is developed in large quantities by pouring fourteen parts of sulphuric acid, diluted with a quarter of its weight of water, upon a mixture of ten parts of common salt, and ten parts of oxide of manganese, in a large leaden vessel. Here part of the sulphuric acid combines with part of the oxygen of the manganese and the sodium to make sulphate of soda, while the other part of the sulphuric acid unites with the protoxide of manganese to form the sulphate of manganese, and setting free the chlorine which originally entered into the composition of the salt. *Chloride of lime*, or *bleaching powder*, is much used as a disinfectant, and being the cheapest it is adapted to those who are limited in their purses. It is largely and cheaply made by special manufacturers of it for the use of the bleachers, and is not therefore required to be made; but under circumstances where it cannot otherwise be obtained, it may be made by passing the chlorine gas obtained by the method above described into a chamber where sifted quick-lime is thinly spread on shelves. *Liquid chloride of lime* is made by rubbing the dry chloride with a little cold water till perfectly smooth, then adding more water, and filtering the solution. *Chlorinated soda* may be readily obtained in solution by mixing one pound of chloride of lime in thirty pounds of water. Then dissolve two pounds of crystallized carbonate of soda in fifteen pounds of water, and mix the two solutions. Let the mixture settle, pour off the clear liquor, and filter. *Chloride of zinc* is made as follows:—Take of sheet zinc, one pound; commercial muriatic acid and water, of each two pints and a half; solution of chlorinated lime, one fluid ounce; prepared chalk, one ounce. To the zinc introduced into a porcelain capsule, gradually add the muriatic acid, applying heat until the metal is dissolved. Filter the liquor through calico, and having added to it the solution of chlorinated lime, concentrate at a boiling temperature until it occupies the bulk of one pint. Permit the solution now to cool down to the temperature of the air, place it in a bottle with the chalk, and having first added distilled water, so that the bulk of the whole may be a quart, shake the mixture occasionally for twenty-four hours. Finally, filter and preserve the product in a well-stoppered bottle. This is Sir W. Burnett's patent disinfecting fluid. Three modern disinfectants—carbolic acid, chloralum, and Condy's fluid—will be found described in the APPENDIX.

(*d*) *Heat* is applied by means of an oven in which certain goods, such as sheets, are baked. It is, however, doubtful whether it is to be depended on without the additional use of chlorine in some shape, or the carrying of the heat to such a high degree as to char the clothes which are to be purified. It is said that a temperature of 200° or 204° will have the effect of disinfecting *fomites* of any kind; and this heat will certainly not injure the ordinary articles upon which it would be employed, being below that of boiling water. Of course, it is only useful for such as would be spoiled by washing, since the usual practice in that operation is to boil the things, which would be still more beneficial.

(*e*) *In purifying* an apartment, if it is uninhabited, large troughs or pans are placed, containing chloride of lime mixed into a paste with water; and pieces of old linen wetted with the same, or with the solution of chloride of zinc, are hung about the room on cords, while the floor is also freely sprinkled with one or the other. If it is inhabited, some limitation must be put upon the amount of chlorine disengaged, which must not be to such an extent as to irritate the lungs. When, therefore, the nurse finds that the chlorides have that effect either upon her or upon the patient, it is necessary to diminish the amount. If drains or cess-pools are to be purified, the lime or zinc may be freely poured into them; and in every infectious disease the utensils in which the discharges are received should contain a small quantity of the solution, by which not only is the smell destroyed, but the prejudicial effect upon the attendants.

DISLOCATION, Nature of, 419; causes and symptoms of, 42; diagnosis from fracture, 420; general principles of treatment, *ib.*

DISLOCATION OF THE FINGERS AND THUMBS, Reduction of, 421.

DISLOCATION OF THE WRIST, Reduction of, 421, 422.

DISLOCATION OF THE ELBOW, Varieties of, 422; reduction of, *ib.*

DISLOCATION OF THE SHOULDER, Varieties of, 422; reduction of, 423.

DISLOCATION OF THE COLLAR-BONE, Reduction of, 423.

DISLOCATION OF THE ANKLE, Reduction of, 424.

DISLOCATION OF THE HIP-JOINT, Varieties of, 425; reduction of, *ib.*

DISLOCATION OF THE JAW, reduction of, 425.

DISORDER, Definition of, 1.

DISTILLATION is effected in a machine called a "still," which consists of a boiler, with a cover luted on to it, but ending in a large pipe. This pipe gradually becomes smaller, and is some yards in length, but coiled round in a spiral direction and contained in a vessel of cold water, from which its lower end projects in the form of a tap. When set in action, the liquid to be distilled (which may be water, or water impregnated with any material which gives out a scent, or a fermented liquor of any kind) is put into the boiler; the head is then luted on, and heat applied, when, as the vapour passes along the worm, it is condensed, and runs out at the bottom in the shape of distilled water, or scented water of some kind, such as rose water, lavender water, &c.; or spirit, such as mere spirit of wine, or brandy, or rum, according to the nature of the fermented liquor inserted in it.

DISTILLED WATER is water which has been converted into vapour, and condensed again in a "still." If, therefore, the water used contains no volatile matter, it is quite pure when distilled, and practically that obtained from ordinary water is so. See *Distillation*.

DIURETICS.—Medicines which increase the flow of urine, 191, 348.

DOSES, Proportionate for different ages, table of, 222.

DOVER'S POWDER. — The compound powder of ipecacuanha, 242; contains one grain of opium in ten.

DOUCHE.—A stream of cold water made to fall from a height. See *Hydropathy*, 205.

DRASTIC.—A term applied to those *cathartic* or *aperient* medicines which act powerfully, by producing watery evacuations.

DRAINAGE, Necessity of, 11.

DRAINAGE, Modes of carrying out.—In carrying off the refuse of a house, the most effectual plan is to lay down drains which shall convey it to some place far removed from the habitations of man. These are now almost invariably made by laying drain-pipes, which are more impervious than bricks, and nearly as low in price. They are generally cemented at the joints, and are laid either in concrete, burnt clay, or plain soil well rammed. Sometimes, however, in re-building a house, there is an abundance of old bricks from chimneys, which are useless except for such purposes, and then they may be used for drains, though they certainly are not equal to glazed drain-pipes. The best form is, if made of bricks, that of an inverted arch covered over with flat stones or tiles, by which arrangement they may easily be opened and cleaned out when any stoppage occurs. A fall of from a quarter to half an inch per foot is desirable, but even less than this will suffice. All drains should be trapped, especially those which open into the sides of brooks to which the wind has free access, for where a current of air sets with great force into a drain, it will blow its gaseous contents into all the apartments near the mouths of its various inlets. A number of stench-traps are, therefore, in use, all of which depend upon the greater relative weight of water over gaseous matters. Sometimes a depression or elbow simply is made in the drain to such an extent that it is always full of water, and this answers every purpose. In other modes, a small square chamber is built in the drain, and a stone is projected into it from above; whilst in a third trap, which is placed at the mouth of the drain, there is an inverted bell with a pipe projecting into it from the drain, and covered with another and smaller bell, whose lip projects lower down than the mouth of the pipe, so that all the water has to descend under the one edge before it rises over the other, and thus the mouth of the drain is always hermetically sealed, unless the gas is driven through with a force greater than the weight of the atmosphere. Mr. Jennings has introduced a bell-trap, which is exactly the reverse of the old one, and is certainly not so liable to get foul, as there is no place where a lodgement can occur. Air-drains are also used in houses with two objects in view, one of which is for the purpose of keeping the walls dry, the other of supplying air to the timbers, and to the fire-places in some houses. In all cases, it is well to lay a two-inch pipe round the outer walls on the top of the footing, and cover this in with broken bricks or rubbish of some kind, over which the earth should be well rammed. These draining-pipes should have a regular fall, however slight, and should lead into a larger drain, which has a good outlet. In some cases, however, there is no possibility of carrying off the contents of these drains, and then a "mud-well" or "cess-pool," is formed at some few yards' distance from the house, and into this the drains are made to empty themselves. In sandy soils they are made of open brick-work, so as to allow the watery particles to soak through; but in clay soils this will not serve the purpose, as the clay itself is quite impervious to water, and in that case they require emptying very frequently, or they must be made of an enormous size. In dry sandy soils, there is no objection to these cess-pools, because the constant soaking away of the water creates a slight *vacuum*, so that, when any liquid is poured down, there is no return of foul gas, as always happens in perfectly water-tight cess-pools. In them for every gallon of liquid, a gallon of gas comes back, or escapes through some "trap," so that there is always a disagreeable smell in the neighbourhood of the openings to them, however well they may be "trapped," and however perfect the apparatus may be with which the closets are furnished. The only feasible plan is to place an opening for the gas to escape at the least objectionable situation, and "trap" all those in and near the house, by which method the interior may be kept sweet; but the neighbourhood of the air-hole will be very offensive in warm weather, when the contents are more than usually inclined to ferment. See *Water-closets*.

DREAMS are actions of the mind during sleep, and are generally *symptoms* of some slight derangement of the bodily functions, though there are some people in good average health who invariably dream. Still it may be considered as a rule that those who are in perfect health, and take sufficient exercise for the good of their bodies, do not dream. Heavy suppers and indolent habits are the usual causes of these phenomena, and if those who are troubled with them will avoid such indulgences, they will seldom have occasion to complain. Dreams are almost always met with in *dyspepsia*, and especially in those who are subject to *constipation;* so that attention to the state of the bowels may be considered of great importance in getting rid of them.

DRESS.—See *Clothing*, 7; *Clothing of the New-born Child*, 72; and *Clothing of the Child*, 289.

DRESSINGS for Sores, 263, 264.

DRESSING of Blisters, 262; of ulcers, 392 *et seq.*; of wounds, 395, 400; of burns and scalds, 400, 403; of frost-bites, chilblains, &c., 403.

DRESSING INSTRUMENTS.—See *Instruments useful in Domestic Surgery*.

DRINKS.—See *Liquid Food*, 15, 16; *Invalid Drinks*, 249; and *Beverage for Children*, 294.

DROPSY is a term used somewhat loosely in medicine to signify an effusion of serum into some part of the body from which there is no natural outlet. The nature of the process by which this fluid is thrown out varies a good deal, it being sometimes the result of active inflammation, as in acute *hydrocephalus*; or again, it may be merely an oozing out of the fluid part of the blood in consequence of obstruction of the circulation, as in ordinary *œdema*. But there is also another kind of dropsy, in which a new *cyst* or *bag* is formed, containing fluid which may resemble serum, or it may be as thick as treacle, and of a dark brown or any shade of that colour, or green. This form is known as ovarian dropsy. When, therefore, any of these dropsical conditions occur, it is necessary to look upon them, not as diseases in themselves, but as *symptoms* either of *acute hydrocephalus*, 121; or *chronic hydrocephalus*, 122; or of the *chest* in consequence of *pleuritis*, 80; or of the *heart* in consequence of *pericarditis*, 81; or of the *abdomen*, and then called *ascites*, which may be caused by inflammation of the *peritoneum*, 83; or from *organic disease of the liver*, 100. The above are all instances of the effusion of serum into the cavity of a serous membrane; but there are also those in which effused serum is met with in the *cellular membrane*, known then as *anasarca* or *œdema*, 71, 101;—while *ovarian dropsy*, 495; and *dropsy of the joints*, 85; together with *dropsy of the eye*, 163; and *hydrocele*, complete the list.

DROPSY, Treatment of.—This will vary according to the situation and nature of the effusion, and with the organ which is implicated. It is, therefore, necessary to ascertain these particulars in the way indicated in the last article, and then to treat the disease according to the directions given in the articles to which reference is made.

DROWSINESS.—By this term is understood an unusual tendency to sleep, so that the person suffering from it "drops off" almost directly after he is roused. There are various degrees of it occurring in different diseases; but taking all its phases, it is a symptom of *congestion of the brain*, 116; of *fevers* affecting the head, such as typhus fever; of approaching *epilepsy*, 147; of a superabundance of bile in the circulation, 116; and of general debility. It occurs in extreme old age also, but for some time previous to that period there is often unusual watchfulness.

DRUGS, Purchasing, preservation, and dispensing of, 219; weights and measures in use for, 220, 221; alphabetical list of those suited to domestic use, and tables of proportionate doses for different ages, 222, 246.

DRUM OF THE EAR.—See *Ear, Anatomy of.*

DRUNKENNESS.—The effect of intoxicating liquors, when taken to excess, is to produce coma (see *Coma*), which is very similar in appearance to that of apoplexy. The smell of the breath will, however, generally serve to detect the difference, and by allowing time the brain will recover its powers. If it is important to give instant relief, the best remedy is cold water applied to the head, and a tea-spoonful of sal-volatile in a wine-glass of water taken internally. Unless the intoxication is very intense, this will generally rouse the brain to perform its functions.

DRY-CUPPING is the application of the cupping-glasses without scarifying the skin; the effect being simply to draw blood into it, without however producing much irritation. It affords some relief during the time that the glasses are drawing, but as soon as they are removed the good effect ceases, and hence the plan is not very often adopted. See *Cupping*, 260.

DUCT.—In anatomy this term is generally used to signify the tube which carries off the secretions of the glands; but it also is employed to describe the canal which conveys the chyle into the large veins, and which is known as the *thoracic* duct, and two short tubes which in the *fœtus* complete the circulation, independently of the lungs—viz., *ductus arteriosus* and *ductus venosus*. The excretory ducts are—1st, the *nasal* duct, carrying the tears from the eye into the nose; 2nd, the *biliary* ducts; 3rd, the *pancreatic* ducts; 4th, the *salivary* ducts; 5th, the *prostatic* ducts; 6th, the *seminal* ducts; and 7th, the *thoracic* ducts.

DULCAMARA (*Bitter-sweet* or *woody nightshade*), 233; decoction of, 232; symptoms of poisoning by, 176; treatment of poisoning by, 511.

DUMBNESS is a congenital defect wholly incapable of cure.

DUODENUM.—The first section or portion of the small intestines. See *Alimentary Canal.*

DUODENUM, Spasm of, causing jaundice, 101; treatment of, 445.

DURA MATER.—The external one of the three membranes of the brain. It is a strong fibrous structure, and serves as an internal *periosteum* to the skull; but it also sends various tightly strained folds between the several portions of the brain, and these materially aid in preventing shocks to that organ, by dividing it into three lesser portions—viz., the *cerebrum* longitudinally by the *falx cerebri*, and the *cerebrum* from the *cerebellum* by the *tentorium cerebelli.* These processes of the dura mater are formed in a peculiar manner by the inner layer only, which is, as it were, pinched up into a fold, leaving the outer one strained in its usual position, and in this fold the large veins (called *sinuses*) of the brain are securely lodged; and while they are protected from injury themselves, they are at the same time prevented from pressing on the brain when gorged with blood by any impediment to its return from the head. There is scarcely any part of the body which shows more beauty and simplicity of contrivance than the dura mater, when viewed as the chief means of guarding the brain from the effects of concussion and compression. The *cranium* serves as a most efficient safeguard against violent blows, &c.; but it is in itself a cause of mischief from the unyielding nature of its walls—so that, if any effusion of blood or serum or engorgement (congestion) of the blood-vessels takes place within its cavity, the brain suffers most materially, and would do so still more if it were not for the safety-valve afforded by the sinuses contained within the *dura mater.*

DYSENTERY, Symptoms of, 52 *et seq.*; causes of, 53; treatment of, in the infant, 306; treatment of, in the adult, 378.

DYSMENORRHŒA, Symptoms of, 168; treatment of, 494.

DYSPEPSIA, Symptoms and varieties of, 153 *et seq.*—as want of tone in the stomach, 155; congestive dyspepsia, 156; irritable or neuralgic, *ib.*; water-brash, *ib.*

DYSPEPSIA, General treatment of, 483.

DYSPEPSIA, Treatment of its varieties—as want of tone in the stomach, 483; congestive dyspepsia, 484; irritable or neuralgic, 485; water-brash, *ib.*; in sea-voyages, 514.

DYSPEPTIC HEADACHE, Symptoms of, 126; treatment of, 464.

DYSPNŒA.—A difficulty of breathing, generally arising from some mechanical impediment to the supply of air, which may be caused either by the air-cells being filled with mucus or serum, or the air-tubes being full of mucus as in bronchitis, or contracted by spasm as in asthma, or it may be the result of a closure of the opening to the larynx from spasm or inflammation, or there may be effusion into the cavity of the pleura by which the lung is prevented from dilating, or from an opening in the walls of the chest, so that their expansion has no effect upon the collapsed lung. Sometimes, however, dyspnœa depends upon organic disease of the heart, which then calls upon the lungs to do double duty upon the blood as it slowly circulates through them; and lastly, it may be occasioned by some obscure condition of the nerves supplying the lungs and heart.

DYSURIA. — Difficulty in passing water. See *Urine, Retention of.*

EAR, Anatomy of the.—The organ of hearing is composed of three parts—1st, the external ear; 2nd, the middle ear or tympanum; and 3rd, the internal ear or labyrinth.

(*a*) *The external ear* consists of the part commonly known as "the ear" (in anatomy called *pinna*), and of the passage to the tympanum called *meatus.* The *pinna* again is divided into several portions named *helix*, *antihelix*, *tragus*, and *antitragus*, *lobulus*, &c. The large hollow space where the passage begins is called *concha*, and has the property of collecting the undulations of sound. The whole of this part is supported in its peculiar shape by a fibro-cartilage; and there are some small muscles, which in most individuals are rudimentary, but occasionally are so well developed as to be capable of moving the ear. All these parts are, however, uninteresting to all but professed anatomists. The passage (*meatus*) is a canal about an inch in length, which extends inwards and slightly forwards, and is somewhat curved with the concavity looking forwards. It is lined with an extremely thin pouch of cuticle, and has some short stiff hairs stretching across it, which protect it from the attacks of insects. In the substance of its lining membrane, there are also a number of *wax-glands* which secrete the peculiar wax found in it. (See Diagram, *fig.* 1.)

(*b*) *The middle ear*, or *tympanum* (*fig.* 1 *b*), is an irregular bony cavity about the size of a horse-bean scooped out, as it were, from the solid or *petrous* part of the temporal bone. Externally, it is deficient in bone, but separated from the meatus by a thin elastic partition, the *membrana tympani* or *drum* of the ear (*fig.* 3 *a*, *b*). Internally, it is bounded by the true organ of hearing, with which it communicates through the means of two small openings (*fenestra ovalis* and *rotunda*), (*fig.* 2). Posteriorly, there is the spongy mass of bone known as the *mastoid process*; and anteriorly, it has a communication with the mouth by means of the Eustachian tube (*fig.* 1 *a*). Within this cavity lie four small bones (*fig.* 4), known as *malleus* (the hammer *a*), *incus* (the anvil *b*), *stapes* (the stirrup *c*), of which a foreshortened view is given at *d*, and *os orbiculare* (the round-bone), which soon after birth becomes a part of the stapes. These bones are attached together by joints and ligaments, and are stretched across the cavity of the tympanum so as to form a means of communicating the vibrations of the drum of the ear to the true internal organ of hearing, where the base of the stapes is attached to the *fenestra ovalis* (see *fig.* 1). The malleus is composed of a head, neck, handle, and two processes. The handle is attached to the drum of the ear throughout its whole length; its point being extended into the middle of the drum, and keeping it in a proper degree of tension by means of muscles, which have the power of raising or depressing it, and which are called respectively *tensor tympani* and *laxator tympani* (see *fig.* 3, in which *a* gives the external view, and *b* the internal). By this beautiful arrangement, the drum in all conditions of the atmosphere is maintained in a vibratory condition, and the sense of hearing is preserved in wet weather and dry, in the heat of summer or the cold of winter. The Eustachian tube is for the purpose of allowing a free communication between the air in this cavity and the outer air, without allowing of the admission of cold air, which would cause inflammation, and hence it is made to open in the back of the throat and nose, out of the way of the draught of air in inspiration. When this tube is closed by inflammation, or any other obstruction, the hearing is imperfect, because the vibrations cannot take place in air confined within an unyielding cavity.

(*c*) *The inner ear* or *labyrinth* (so called from the complexity of its structure) consists of a series of bony cavities lined by a membrane (see *fig.* 1, *c*, *d*, and *fig.* 2, which is the same part enlarged). The bony portion must first be described, consisting of—1st, the *vestibule*; 2nd, the *semicircular canals*; and 3rd, the *cochlea*. The *vestibule* (*fig.* 2 *a*) is a small triangular cavity, which

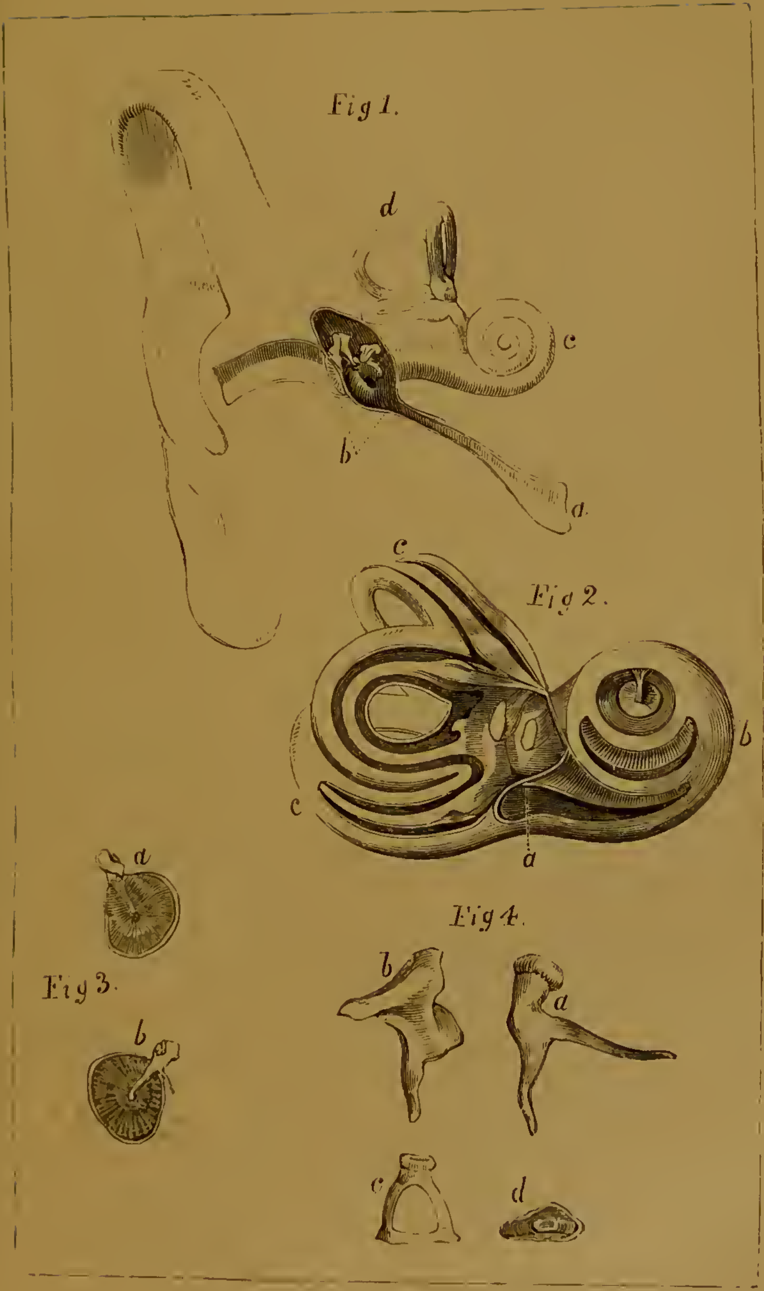


DIAGRAM OF THE EAR.

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comes next to the middle ear, and has seven openings, besides some smaller ones, for the passage of minute arteries and nerves. These openings are—1st, the *fenestra ovalis*, which has been already alluded to (see the *middle ear*); 2nd, the opening to the *scala vestibuli*, presently to be described under *cochlea* (and both shewn in *fig.* 2); 3rd, five openings leading to three semicircular canals one being common to two of these. The *semicircular canals* (*fig.* 2 *c*), are three bony tubes, hollowed out of the petrous portion of the temporal bone, and communicating with the vestibule as above mentioned. They have a slight bulge or ampulla at one extremity, and are lined by a membrane throughout, as we shall presently see. The *cochlea* (*fig.* 2 *b*) resembles a *snail-shell*, forming the anterior portion of the labyrinth, but still within the bone. It consists of a tapering canal about an inch and a half in length wound spirally round a centre, called the *modiolus*, about which it makes two turns and a half. This modiolus is of a pyramidal form, the base being pierced by small openings, through which the nerves pass to supply the organ of hearing. The canal around it is divided into two passages or *scalæ*, partly by a lamina of bone, and partly by membrane; so that in reality there are two canals making these turns round the modiolus, and these are called the *scala vestibuli* and *scala tympani*. The termination of the scala vestibuli has been already alluded to as being in the vestibule, while the termination of the *scala tympani* is in the *fenestra rotunda* of the middle cavity of the ear (see the *middle car*). After having examined this bony portion of the labyrinth it is necessary to investigate the structure of the *membranous lining*, which is smaller in size than the bony labyrinth, but an exact counterpart in form. It is retained in its position by the numerous nervous filaments, which are supplied to it through the openings in the inner wall of the vestibule, and it is separated from the bone by a thin layer of watery fluid (*aqua labyrinthi*), which also fills its interior. The nerve of hearing (*auditory nerve*) is spread out on its surface, or rather between its layers, and the vibrations received by the *fenestra ovalis* from the stapes are communicated to its whole extent by the fluid in which it floats, and which is confined within these tortuous canals, with only one other elastic or yielding medium, viz., the *fenestra rotunda*. This appears to be the sole use of the *fenestra rotunda*, and a very important one too, for without its yielding membrane, no vibration could be communicated to the labyrinth, because it would be floating in a fluid which could not give way when pressed upon by the stapes, but which by its means readily yields, having an elastic membrane covering the two extremities of its chief tubes. For the physiology of hearing, see *Hearing, Sense of.*

EAR, Diseases of the, and their general treatment, 164, 333, 488, 490; purulent discharge from the, 164, 333, 490; internal inflammation of the, 464, 491; surplus accumulation of wax, 164, 490; chronic inflammation of the, 164; nervous ear-ache, *ib.*; polypus of the, 164, 491.

EAR, Treatment of diseases of the, in children, 333—as scrofulous discharges, *ib.*; nervous ear-ache, 334; bead, pea, or other foreign body in, *ib.*

EAR, Noises in the.—These unpleasant sensations in the ear, when *chronic*, are symptomatic of accumulation of wax, 161; or of neuralgic dyspepsia, 156; or of determination of blood to the head, 118. In *acute* cases they occur in most fevers, and in inflammation of the brain, 120, as well as in delirium tremens, 117.

EAR-SYRINGE, Use of the, 226.

EARLY-RISING has been inculcated as a wholesome practice from time immemorial, and to those who can contrive to get to bed also in good time is unobjectionable in every way; but, on the other hand, if the employment is of such a nature as to prevent the occupation of the bed at a proportionately early hour, it is absurd to recommend the one without the other. The fact is, that those who are late in the morning are also late at night, and are *then* usually occupied in an unhealthy way, so that it is at the night-time that the mischief is done, and not in the morning's slumber. It may be said that the one necessitates the other, and that if early rising is inculcated and followed, early going to bed must be the consequence; but this is not strictly true, for many have seriously injured their health in attempting to improve it by restricting their hours of sleep too much. If, therefore, health is to be consulted, it is far better to insist upon the abandonment of unwholesome night amusements and occupations, and upon the early lying down, and then there will soon follow a corresponding early rising in self-defence, for bed becomes irksome to every one after a certain number of hours, varying, however, with different individuals. Some require six or seven, some eight or nine hours in the twenty-four; but if we all made a practice of getting up as soon as we wake, we should find that the sleep would be sounder and more wholesome, and that it would seldom extend beyond seven or eight hours. The plan of rising a long time before breakfast, and taking a walk on an empty stomach, is, I am confident, a bad one; and though it may be adopted by some people without injury, yet if attempted by those of delicate constitutions, it will do a vast deal of harm. Half an hour or an hour before that meal may well be passed in a short walk, but beyond that time the stomach becomes weakened in tone, and the meal when taken is followed by a dull and heavy sensation of fatigue and listlessness, instead of the sprightly readiness for the day's occupation, which it ought to be the ambition of every one to possess.

ECCHYMOSIS is an extravasation or pouring out of blood into the structure itself of the organs of the body. It may be the result of violence, as in a common bruise, or it may occur from the bursting of a vessel or vessels from disease. In those who are afflicted with the hemorrhagic diathesis, 145, an ecchymosis is constantly occurring from the most trivial cause. For example, a fit of coughing or of vomiting will cause an ecchymosis of the vessels of the eye, as indicated by a red or blood-like colour, instead of the pure white of that organ; or there may be some apparent bruises in the arm or face, or on any other part of the body, all caused by the same giving way of the vessels occasioned by the straining. When such a result takes place, there is no help but patience, and in time the absorbents will remove the blood just as in an ordinary bruise.

ECTHYMA (*Pimply scale*), Nature of, 69; treatment of, 388.

ECZEMA (*Running scale*), Symptoms of, 63; as simple eczema, *ib.*; aggravated eczema, *ib.*; eczema impetiginodes, *ib.*; eczema capitis, *ib.*; eczema solare, 64; washerwoman's itch, *ib.*; grocer's itch, *ib.*; eczema mercuriale, *ib.*

ECZEMA, Diagnosis of, 64; treatment of, 384, 385.

EFFERVESCENCE is a term in general use to signify the rapid disengagement of gas-bubbles in a fluid. Generally this is produced by the decomposition of some of the alkaline carbonates, by the addition of a vegetable acid which has a greater affinity for the alkali than carbonic acid (see *Decomposition*); but sometimes the effervescence takes place from the cork being removed which has kept the carbonic acid gas in a state of compression and consequent liquidity. The gas in this case has either been forced into the liquid by mechanical means, as in the case of ordinary soda-water; or it has been developed in a confined vessel by the fermentation of the fluid in it, as in the sparkling wines, ginger-beer, &c.

EFFERVESCING WATERS, Preparation of, 251.

EFFLUVIUM.—A disagreeable and noxious emanation or exhalation. It is generally applied to those which are offensive to the sense of smell.

EFFUSION.—Literally a "pouring out" either of serum or blood; but the term in medicine is restricted to those which take place into certain situations. Thus watery or bloody secretions into the alimentary canal are not called effusions; while if the same takes place into the bronchial tubes in the last stage of bronchitis, effusion is then said to have occurred. The chief seats of effusion are the brain, chest, and cellular membrane, constituting serous or sanguineous apoplexy, or hydrocephalus in the first organ; or effusion into the pleura, or the substance of the lungs, or into the bronchial tubes, or the pericardium in the second; or œdema or anasarca in the last; or, again, there may be effusion into the joints either of pus or of synovial fluid in excess.

EGGS.—These are generally employed as laid by the domestic fowl, but all birds' eggs are equally composed of almost pure albumen. The white has only a small proportion of salts in addition to albumen and water, but the yolk has also both phosphorus and oily matter. The latter is very useful in causing oils and balsams to combine with water in the form of emulsion (see *Emulsion*). As an article of food, eggs are highly nutritious, and to some people very digestible, but weak stomachs can seldom effect their proper digestion.

EGG-FLIP, Receipt for making, 249.

EGGED-WINE, Receipt for making, 249.

ELASTICITY.—The property of extensibility and of returning at once to the previous condition. This is more or less perfect in certain substances, such as steel, which is elastic in one direction, but not in the other—that is to say, it may be bent but not readily stretched; whereas Indian-rubber, especially when vulcanised, will bear bending or stretching, and yet when released, at once returns to its previous shape. See *Indian-rubber*.

ELATERIUM.—A powerful purgative and diuretic, but unfitted for domestic use, being capable of causing death in a very few hours.

ELBOW-JOINT, Composition of, 422; symptoms of various dislocations of, *ib.*; and treatment of, *ib.*

ELECTRICITY.—See *Galvanism*.

ELECTUARY.—A form of medicine resembling that known in cookery as a *jam*.

ELECTUARY FOR PILES, Formulas for, 474.

ELEPHANTIASIS.—A chronic swelling of the skin and cellular membrane of the legs peculiar to hot climates. Its treatment is of too complicated a nature to be usefully introduced here.

ELIMINATIVES are drugs which promote secretions, 191; various prescriptions for, 345, 348.

ELM BARK.—The *inner* bark of the elm is sometimes used as a remedy for skin diseases; but it does not appear to possess any specific effect. It is said to be tonic, and at the same time diaphoretic. It is given in the form of decoction, of which a tea-cupful is the dose three or four times a day. The decoction is made by boiling two ounces and a half of the fresh bark in two pints of water down to one pint and straining.

EMACIATION is a wasting of all the tissues of the body, and when it occurs with a full supply of nourishment is a sign of great organic disease, or at all events of serious functional disturbance. A mere loss of fat is not emaciation, as there may be with this a high condition and fulness of the muscle, and the very greatest degree of health; but in true emaciation the muscles waste as much as the fat, and the nourishment of the whole body is affected. It occurs as a symptom of severe fevers, after which it is very marked, also in dyspepsia, pulmonary consumption, marasmus or atrophy, and in organic disease of the stomach, liver, and bowels, by which these organs are prevented from carrying on the nutrition of the body. It is also evident in any kind of starvation.

EMBROCATION, Prescriptions for, 349. See also *Liniments.*

EMETICS are drugs which are used to produce vomiting for various purposes. Antimony, sulphate of zinc, and ipecacuanha are those which are principally used in medicine; but the two first are somewhat too powerful, excepting for extreme cases. A tablespoonful of common salt in a quart of lukewarm water gradually drunk will serve for common purposes; but it is not to be relied on in poisoning, or in severe cases of disease like croup, &c.

EMETICS, Formulas for, 349; useful in the disorders of children, 270.

EMMENAGOGUES. — Medicines which are supposed to have the power of restoring the function of menstruation. Those which are usually employed appear to act chiefly by the improvement which they effect in the general health and in the condition of the blood, and thus indirectly influence this secretion along with all the others. Such is the nature of steel medicines of all kinds; but the combination with aloes is with the intention of stimulating the lower bowels, and at the same time extending that effect to the uterus, from its proximity to them. See *Amenorrhœa* and *Chlorosis.*

EMPHYSEMA.—This term is used in medicine to signify the presence of air in the cellular tissue of the body; but it is also made to include a dilatation of the air-cells of the lungs, as well as the true emphysema of the lungs, which is called *interlobular.* There are two modes by which air may be thus introduced—1st, by mechanically forcing it from the wind-pipe or lungs into the cellular tissue of the lungs, or of the body generally; and, 2nd, by the spontaneous development of gas within the cells. The former is called *traumatic*, the latter *spontaneous, emphysema;* besides which there is the *emphysema of the lungs,* above alluded to.

(*a*) *Traumatic emphysema* is common enough after wounds which communicate in any way with the organs of respiration. Thus a wound or ulcer of the *mouth* or *nostrils* may allow air to enter, or of the *trachea* or *larynx,* or a *rupture of the air-cells* without any external wound, may allow the air to extend into the cellular tissue of the lungs, and through their roots to other parts of the body; or, there may be a *perforation of the walls of the chest, and of the lung itself;* or, lastly, the *walls may be perforated, while the lung remains uninjured,* the air being drawn in during inspiration, and forced out again partly into the cellular membrane, and partly through the external wound. All these various conditions are evidenced by a peculiar elastic swelling, crackling under the finger. Sometimes the emphysema is very extensive, and nearly the whole surface of the body is implicated. The *treatment* consists in enlarging the external orifice of the original wound where it can be done with safety, so as to prevent its valvular action which originally caused the retention of the air. If the emphysema has arisen from a fractured rib, as is often the case, the further progress of the accident may be prevented by the application of a tight bandage, as is usually practised for the management of the fracture itself. Sometimes, however, this plan interferes with respiration, and then the bandage must be removed, and small punctures made with a lancet in the skin to allow of the escape of air. This may also be done upon the surface of the body if the air is extensively spread over it, and indeed is all that can be done in most cases.

(*b*) *Spontaneous emphysema* seldom occurs excepting as a consequence of gangrene, when gas is often disengaged, and extends into any loose cellular membrane which may be in the neighbourhood of the parts affected. Some few cases are recorded in which gas was apparently generated in the cellular membrane without any accident or gangrene; but these are so rare as to be only interesting to those who are curious in medical events which only happen once in a century or so. In either case, little can be done beyond, making a few small punctures to release the gas.

(*c*) *Emphysema of the lungs.*—In examining the texture of the lungs, we find that it is composed—1st, of the extreme ramifications of the bronchial tubes, which go on subdividing until at last they end in a *cul-de-sac*, or cell of extreme delicacy, on the walls of which the blood-vessels are seen in a beautifully fine net-work; 2nd, of the common cellular membrane, which serves to connect these cells together, and which likewise forms several membranous partitions to the various lobes and lobules of the lungs, and which is here called the *interlobular cellular tissue* of the lungs. Each of these textures is subject to emphysema, that attacking the former being called *vesicular* or *pulmonary emphysema*, while the latter receives the name of *interlobular emphysema*.

(*d*) *The symptoms of vesicular or pulmonary emphysema* are permanent shortness of breath, often so severe as to merit the name of dyspnœa, especially after exercise—a dusky hue of the countenance in bad cases, and extremities cold. The fits of difficulty of breathing come on without notice, and are accompanied by palpitation of the heart, with great blueness of the face and lips, slight cough, and scanty expectoration of a thin mucus mixed with small clots and filled with air-bubbles. After a time the health suffers, the legs swell, and the general cellular membrane participates in the mischief.

(*e*) *The symptoms of interlobular emphysema* are very similar to those already described as appertaining to the previous variety, but its advent is generally more rapid, and is almost always consequent upon a violent fit of coughing. Both this and the former kind of emphysema are beyond the probability of discovery by the ordinary observer, unless the air is observed to extend to the adjacent part, when the symptoms above described are at once accounted for.

(*f*) *The treatment of emphysema of the lungs* consists in attempting to afford relief during the paroxysms by giving opiates with ether. Thus 20 or 30 drops of laudanum may be combined with from 30 to 60 drops of sulphuric ether, and made into a draught with a little camphor mixture, which is to be taken as soon as the fit comes on. At the same time the shoulders should be raised, and plenty of air should be admitted. Beyond this antispasmodic draught little can be done, except that every precaution should be taken to avoid "catching cold," or producing any disturbance of the stomach likely to give rise to flatulence, which would mechanically interfere with the action of the lungs.

EMPIRICISM, Nature of, 184.

EMPYEMA.—A result of chronic pleurisy, 80; treatment of, as the result of chronic pleurisy, 410.

EMPYREUMA. — Many animal or vegetable substances when they are exposed to a moderately high temperature in a closed chamber become burnt, and give out a disagreeable smell which is very offensive to the nose, and the substance itself becomes indigestible. For this reason burnt pastry is unfitted for delicate stomachs, and baked meats are not so wholesome as roast, unless the oven is remarkably well provided with ventilation, as in that mode the development of empyreuma is prevented.

EMULSION.—A mixture of oil or balsam with water by means of some third substance, such as yolk of egg, or mucilaginous infusion, or syrup. Egg and the mucilage of gum-arabic are the ordinary means employed in medicine, and with either of them almost any oily matter may be rendered into an emulsion. The ordinary salad mixture is a common form of using oil in the shape of emulsion, the salad-oil being beaten up with the yolk of egg until it is thoroughly broken up and rendered soft and thick. Castor-oil is often given in this way, also turpentine, naphtha, &c.

ENAMEL.—The outer covering of the teeth, 92, 93.

ENCEPHALON.—A term in medicine used to designate the parts within the skull—viz., the *brain and its membranes.*

ENCYSTED TUMOURS occur in all parts of the body, and consist of little bags with firm and almost cartilaginous walls, containing a cheesy matter which is chiefly of an albuminous nature. Their origin is wrapped in obscurity. They are very common on the head, where they show very plainly, especially in those who have little hair, looking like soft eggs beneath the scalp, and on the average being about the size of a bantam's egg. No *treatment* is of the slightest use, except their removal by the knife, which is most easily effected, as by cutting pretty freely through the skin and their external wall, the contents escape, and then the bag can be readily torn out without much pain, as it is very slightly attached to the adjacent parts. Great care should be taken to leave no part of the sac or bag behind, as it would reproduce the disease, but the slightest degree of tact is sufficient to prevent this occurrence. The bleeding in this operation is confined to the vessels of the skin, and will of course vary with the part in which they lie; but on the head it is so trivial, as to cause no risk or inconvenience. When these tumours occur in other parts of the body, they are better left to the regular surgeon, for fear of injury to important vessels or nerves which a knowledge of anatomy alone can prevent.

ENCYSTED TUMOURS of the eyelids, 489.

ENDEMIC, 4 (*par.* 17).

ENDERMIC application of medicines is that by which they are made to act through the skin. Thus mercury or iodine may be taken by the mouth, or they may be rubbed in, either method producing the same constitutional effects. Whenever this method is effectual, and there is time for its operation, it should be preferred, as by its means the stomach is relieved from the ill-effects which all drugs produce upon it; while the skin is not only a less important organ, but it also much sooner recovers from any unnatural stimulus to it. This method has, however, been little adopted, because it entails considerable time and trouble, and because its effects are not quite so rapid as when the same medicine is given by the mouth. Nevertheless, when the abuse of the stomach by drugs is considered, it ought to lead to some more general adoption of the *endermic method* of treating disease.

ENDOSMOSE AND EXOSMOSE.—When two fluids of different densities are separated by a thin membrane, there is an admixture of their elements through its pores. In all cases, however, the denser fluid will have more difficulty in traversing the membrane than the thinner one, and consequently the bulk on its side will increase, while the contrary will take place on the other side. If one of these fluids is contained in a sac or cavity—as for instance, a grape among vegetables, or a bladder tied at its neck among animal membranes—and they are immersed in a fluid of different density, the change which takes place is called *endosmose* and *exosmose*, the former being applied to the current *into* the bladder or grape, and the latter to the passage of the fluid *out* of them. In order to test this action experimentally, the *cæcum* or blind gut of a fowl should be tied on to a small glass tube, which should be partly filled with coloured syrup or gum-water, then immerse the *cæcum* in pure water, and mark the height at which the syrup stands in the tube. In a few hours it will be seen to rise very considerably, from the water passing into the syrup by *endosmose*, while a small portion of the colour may be seen to pass into the water by *exosmose*. Now, reverse the experiment, and instead of filling the *cæcum* with syrup, pour into it a small quantity of pure water, and immerse the whole in coloured syrup, instead of in cold water as before, again marking the height of the water in the tube. Here the volume of water contained in the tube rapidly shrinks, what little remains being slightly stained with the colour of the syrup. The action has been exactly the reverse, but the *exosmose* and *endosmose* have gone on just the same, though the increase has been in the contrary direction. It is in this way that it is supposed the digested fluids contained in the stomach and small intestines are received into the blood-vessels; for as the blood is a fluid of greater density than the saline or other thin solutions in the stomach, it will have a tendency to draw them to itself through the walls of the small vessels. The circulation of the blood in them has also a great tendency to increase this power of absorption, as may readily be proved by experiment; and hence it is a fact, that some substances may be detected in the urine within half an hour or less of their being swallowed.

ENEMAS are injections of water, gruel, &c., either plain or medicated, thrown up into the rectum with an instrument of some kind. Until within the last forty years, a bladder armed with a bone pipe was the usual method of giving an enema, and a very disagreeable one it was to all parties concerned; but when Mr. Read invented the stomach-pump, the principle of the ordinary pump was at the same time applied to the enema-syringe. Prior to that time the valves of pumps were made of leather, and these soon became destroyed by occasional use, being either made rotten if constantly wet, or too stiff if allowed to get dry. The metallic valve, however, met the difficulty; and since his time, enemas have been in constant use in this country, and still more generally on the Continent, especially in France, where "*lavements*" are the occurrence of every day in most large establishments. Enemas may be employed for several purposes—1st, for producing reaction of the bowels; 2nd, for preventing diarrhœa; 3rd, for the administration of opiates, either generally when the stomach is wished to be undisturbed, or locally when the rectum, bladder, or womb require a sedative; 4th, for the administration of antispasmodics, as in colic or tympanitis; and, 5th, for the purpose of supporting life by giving food, when the stomach cannot be reached, or will not retain it.

(*a*) *Enemas intended to act on the bowels* are composed either of warm water or cold water, or of some medicated fluid, as described under the head of *Habitual Constipation*, 486.

(*b*) *Enemas as used for preventing diarrhœa* are alluded to under that head. See 306 (*par.* 1050) for the quantities proper for the child, and 378 (*par.* 1199) for the adult. The method of using this kind of injection is to be found at 306.

(*c*) *Opiates are administered* by an enema in the same way and dose as is given at (*b*).

(*d*) *Antispasmodic enemas* as resorted to in colic consist either of warm water (see 417, 418), or half an ounce of spirit of turpentine and an ounce of castor-oil may be well mixed with a quart of gruel and thrown up into the rectum.

(*e*) *When enemas are used for the purpose of giving food*, beef-tea, with or without port-wine, is the aliment almost invariably selected. It should be made strong, and the addition of the gelatinous soup which is now generally sold will serve quite as well for the purpose as the best beef-tea, although not so good for the stomach if swallowed.

ENEMA-SYRINGE, Use of the, 226.

ENTERITIS *(or inflammation of the serous coat of the intestines themselves)*, symptoms of acute, 84; symptoms of chronic, *ib.*; treatment

of acute, 412; treatment of, in the infant, *ib.*

ENTOZOA, Human, varieties of, 157, 158—as worms, 157; hydatids, flukes, &c., 158.

ENTOZOA, Human, symptoms of, 157 *et seq.*

ENTOZOA, Human, removal of, in the child, 330; in the adult, 486.

ENTROPION, Symptoms of, 162; treatment of, 489.

EPHEMERAL FEVER, Symptoms of, in the adult, 24; treatment of, 350; symptoms of, in the child, 298; treatment of, *ib.*

EPIGASTRIUM.—The pit of the stomach. See *Abdomen.*

EPIDEMIC INFLUENCES on Health and Disease, 4.

EPIDERMIS, or *Epiderma.* — The cuticle or scarf-skin, 45.

EPIGLOTTIS.—A small spoon-shaped piece of fibro-cartilage, which is attached between the base of the tongue and the opening of the larynx, and which serves as a valve to the latter when the food is swallowed, and by which this is prevented from passing into it. It is liable to various diseases, as thickening, ulceration, &c., and is sometimes wholly or partially destroyed, when the greatest difficulty is experienced in swallowing food, as it passes into the larynx and causes suffocation. See *Larynx.*

EPILEPSY, Symptoms of, 147; diagnosis from apoplexy, 148; treatment of, in children, 329; treatment of, in adults, 480, 481.

EPIPHYSIS.—The ends of the long bones are developed in a separate form, and only united by bony matter after childhood. These are called *epiphyses*, and are sometimes broken off by accident.

EPISTAXIS.—Bleeding from the nose is so called in scientific nomenclature.

EPISTAXIS, Symptoms of, 146.

„ in the child, treatment of, 334, 335; in the adult, treatment of, 478.

EPITHELIUM.—The internal layer of mucous membrane, 45.

EPSOM SALTS, or *sulphate of Magnesia*, 287.

ERGOT OF RYE has the property of increasing uterine action during labour, but it is not a safe remedy in the hands of those who have not had great experience, and should not, therefore, be employed in domestic medicine.

ERRHINES are stimulating applications to the mucous membrane of the nose, generally in the form of dry snuff. They are sometimes used for headache, but are not deserving of any confidence.

ERUCTATION is the rising into the mouth of the gaseous or fluid contents of the stomach without vomiting. It is very common in indigestion, and especially with those who habitually overload the stomach. Water-brash (156) is an extreme form of this disordered condition. See *Dyspepsia*, 153 *et seq.*

ERUPTIONS of the Skin, nosological arrangements of, 57, 58.

ERUPTIONS of the Skin, symptoms of various kinds of, 58 *et seq.*—as erythema, 59; erysipelas, *ib.*; rose-rash, 61; nettle-rash, *ib.*; herpes, 62; eczema, 63; scabies, 64; pemphigus and pompholyx, 66; rupia, *ib.*; acne, *ib.*; sycosis, 67; scall'd head, 67, 68; impetigo or crusted tetter, 69; ecthyma, 69, 70; boils, *ib.*; lichen, *ib.*; prurigo, 71; leprosy and psoriasis, *ib.*; dandriff, *ib.*; icthyosis, *ib.*; lupus or noli-me-tangere, 72; spots or marks, *ib.*; warts and corns, *ib.*; moles and condylomata, 73; baldness from eruption, *ib.*

ERUPTIONS of the Skin in new-born infants, treatment of, 278, 279—as erysipelas and erythema, 278; red-gum, 279; yellow-gum, *ib.*

ERUPTIONS of the Skin in children, treatment of, 310 *et seq.*—as erythema, 310; rose-rash, *ib.*; nettle-rash, *ib.*; herpes labialis or "breaking out," 311; ring-worm, *ib.*; scabies or itch, 312; pemphigus and pompholyx, 312, 313; scall'd head, 313; crusted tetter, 314; chilblains, *ib.*

ERUPTIONS of the Skin in the adult, treatment of, and general remarks on, 381 *et seq.*—as erythema, 382; erysipelas, *ib.*; nettle-rash, 384;

acute eczema, *ib.*; chronic eczema, *ib.*; crusta lactea, 385; eczema of the head, *ib.*; mercurial eczema, *ib.*; eczema of the navel of new-born infants, *ib.*; solar eczema, *ib.*; washerwoman's itch, *ib.*; grocer's itch, *ib.*; rupia, 386; acne simplex, *ib.*; acne rosacea and indurata, 387; sycosis, 388; ecthyma, *ib.*; boils, *ib.*; carbuncle, 389; lichen, *ib.*; prurigo, *ib.*; lepra and psoriasis, *ib.*; dandriff, 390; lupus, *ib.*; freckles, *ib.*; warts, *ib.*; corns, 391; condylomata, *ib.*; bunions, *ib.*; baldness, 391, 392.

ERUPTIVE FEVERS, Symptoms of, 31 *et seq.*—as small-pox, 31; cow-pox, 33, 36; chicken-pox, 37; measles, 38; scarlet fever, *ib.*; plague, 40; miliary fever, *ib.*

ERUPTIVE FEVERS, Treatment of, in children, 300 *et seq.*—as cow-pox, 300; chicken-pox, *ib.*; measles, *ib.*; scarlet fever, 301, 302.

ERUPTIVE FEVERS, Treatment of in the adult, 360 *et seq.*—as small-pox, 360; chicken-pox, measles, and scarlet fever, 361, 362; plague, 362; miliary fever, *ib.*

ERYSIPELAS, Diagnosis of, 59; idiopathic, symptoms of, 60; traumatic, symptoms of, *ib.*; essence of, *ib.*; in the new-born infant, treatment of, 278; treatment of, in the adult, 383.

ERYTHEMA, Symptoms of, 59.

,, Treatment of, in the new-born infant, 278; treatment, of, in the child, 310; treatment of in the adult, 383.

ERYTHEMA NODOSUM, Treatment of, 310.

ERYTHEMA TUBERCULATUM, Treatment of, 382.

ESCHAR, in surgery, is applied to the slough which separates after deep burns, or in consequence of the application of powerful caustics.

ESCHAROTICS, in surgery, are those powerful caustics which cause an *eschar* to be separated.

ETHER (also written *æther*), 224; symptoms of poisoning by, 176; treatment of poisoning by, 511.

EUSTACHIAN TUBE.—A canal leading from the middle ear to the back of the throat. See *Ear, Anatomy of the.*

EXANTHEMATA.—See *Eruptive Fevers.*

EXCITANTS are those medicines which accomplish the excitation or stimulation of the functions of the body. The term *stimulant* is, however, more generally used. See *Stimulants.*

EXCITATION is an action by which the vital functions are augmented in the degree of their performance. The term is used in medicine synonymously with *stimulation.*

EXCITEMENT is the act of excitation itself when accomplished. See *Excitation.*

EXCORIATION.—A slight rubbing off of the cuticle, leaving the true skin in a raw and unprotected condition. The best remedy is the water-dressing, 264, or any other means of excluding the air will do nearly as well—as, for instance, collodion, or any mild sticking-plaster, or the isinglass-plaster, or gold-beater's skin—all of which act by protecting the cutis from the irritation of the air.

EXCRETION is a term which has been long employed in physiology to signify a particular kind of secretion—viz., that of fluids which are no longer useful to the body, such as urine and perspiration, and are not intended to perform any useful purpose, like milk, or gastric-juice, or the salivary or pancreatic fluids. But it is usual now to consider all the various processes by which any material is elaborated from the blood as true secretions, although the difference above mentioned is still recognized to the fullest extent. There are, indeed, one or two fluids which appear to be removed because their elements are of a noxious nature, and yet they afterwards serve some good purpose in the animal economy; as an instance of which the bile may be specified, for though we find its retention in the blood to be poisonous in the highest degree, yet when secreted it answers a good purpose, by stimulating the intes-

tines, and by putting the finishing stroke to the digestion of the food. See *Digestion.*

EXERCISE of Body and Mind, importance of to health, 11, 14.

EXERCISE in removing disease, 251; active, passive, and mixed, *ib.*; of body and mind to be attended to in treating disease, 252.

EXERCISE, necessity of, for infants, 285; necessity of, for children, 296.

EXHALATION, as a physiological term, means the evaporation of fluid through a membrane, as in the case of the lungs and skin, which exhale a large quantity of vapour. The amount of fluid which usually passes off in this way from the lungs is about sixteen or twenty ounces; but part of this is probably due to the vapour already contained in the air when inspired; still it is supposed that some part of it is actually formed in the body by the union of a portion of oxygen absorbed in the lungs with the hydrogen of the blood. Together with the water thus exhaled, there is also an amount of organic matter, which is easily proved by collecting the fluid in a closed vessel, and exposing it to a gentle degree of warmth, when a putrid odour is soon perceived, being composed of animal matters over and above the mere water. In the same way, there is constantly going on from the skin an exhalation of watery fluid. Under ordinary circumstances, this is carried off in a state of vapour, forming the *insensible perspiration;* and it is only when its amount is much greater than usual that the fluid remains, *as fluid,* on the surface of the skin, and is then called *sensible perspiration.* It is not very easy to ascertain the amount of solid matter in this fluid; but it is generally calculated at about one per cent., consisting partly of lactic acid, partly of saline matters, and partly of a proteine compound, the nature of which is not well made out. The amount of perspiration excreted from the skin varies with the temperature of the air, but it is generally about double that of the lungs. The pulmonary and cutaneous exhalations are greatly influenced in amount by that of the kidneys, so that, if the urine is copious, the perspiration is diminished, and *vice versâ.* See *Respiration* and *Skin.*

EXHAUSTION.—By this term is understood, in medicine, a state in which either all the functions of the body cease to act, or only that one upon which all others depend for their supply of blood—namely, the heart. Generally speaking, the seat of exhaustion is in the nervous system, which ceases to supply the material, whatever it may be, which is required in order to stimulate the various organs to a due performance of their several duties. Hence, when this fails, there is what is called a state of nervous exhaustion, though in reality the addition of the adjective is a specimen of tautology; since, as before remarked, the essential seat of exhaustion is in the nervous system, whether the heart or any other organ or organs is secondarily affected. It is, therefore, necessary to apply our remedies with a view to re-invigorate the nerves, and nourish their substance, and whatever has that effect will be the most serviceable. Temporary stimulants are of little avail, and for this reason brandy or wine should be added to beef-tea, or egg, or some similar nutritious article.

EXFOLIATION, Nature of, 94; treatment of, 430 (*par.* 1333).

EXPECTORANTS, Action of, 345; list of, 191; for children, 270.

EXPECTORATION, in medicine, has a double signification, being firstly applied to the mucus, pus, or blood coughed up from the lungs, and secondly, to the act by which these are brought up. The latter sense of the word may at once be dismissed, as being always the same, and being merely synonymous with coughing; but the former requires further consideration, inasmuch as upon the nature of the matters expectorated (that is, of *the expectoration*) will often depend the view which is to be taken of the disease. The expectoration viewed

in this light may be either (*a*) frothy, (*b*) stringy, (*c*) purulent, (*d*) lumpy, (*e*) membranous, (*f*) stringy and rusty coloured, or (*g*) it may be more or less mixed with blood, or lastly it may have a putrid smell (*h*).

(*a*) *Frothy expectoration* is indicative of bronchitis, 48; or of the congestion of the mucous membrane which occurs in catarrh, 47; or influenza, *ib.*

(*b*) *Stringy expectoration* of a whitish or yellowish colour occurs chiefly in chronic bronchitis, 48; or in spasmodic bronchitis, 49; or in hooping-cough, *ib.*

(*c*) *Purulent expectoration* sometimes makes its appearance in the latter stages of catarrh and influenza, 48; but the *sputa* are then more or less mixed with a tenacious mucus. If genuine *pus* capable of being readily poured from one vessel to another is expectorated, it is a symptom of a *vomica* having burst, or of the matter of *empyema*, 80, having found its way into the bronchial tubes. In humoral asthma, a large quantity of yellow matter is often expectorated, but it is chiefly mucus, and is not entitled to be considered of a true purulent nature.

(*d*) *Lumpy sputa* are seldom met with except in pulmonary consumption; and if they are undoubtedly found, there is little hope of any mistake being made as to the nature of the disease. These lumps can only be compared to small whitish or yellowish oysters floating in a thinner fluid, though sometimes they are much more flocculent than would be described by the above simile; but still they are quite distinct in themselves, and the two substances do not readily mix together. Very rarely in chronic bronchitis without tubercles, lumps somewhat similar to these are seen; but the instances are so few, that for all practical purposes the rule may be laid down that lumpy expectoration is a sign of the softening of tubercles—in other words, of tubercular consumption.

(*e*) *Membranous casts* coughed up indicate a croupy inflammation of the bronchial tubes; and when they occur, there has generally been a severe attack of inflammation, either to the extent of *croup*, 51, or of a similar character.

(*f*) *A stringy and rusty-coloured expectoration* is peculiar to pneumonia, 76; and is quite a reliable sign of that disease.

(*g*) When the expectoration is largely mixed with blood, there is either a broken blood-vessel, or the bronchial membrane has oozed blood. This is called hemoptysis in either case, and is described as such at 146.

(*h*) *Offensive and putrid smelling expectoration* is a sign of gangrene of the lungs, 76; but it is not to be relied on without the addition of other symptoms.

EXPIRATION is breathing out, as inspiration is drawing in, breath. See *Respiration.*

EXTRACTS, Nature of, 233; various useful kinds of—as extract of colocynth, *ib.*; of dandelion, *ib.*; of gentian, *ib.*; of henbane, *ib.*; of hop, 234; of lettuce, *ib.*; of sarsaparilla, *ib.*

EXTRAVASATION of Blood is the pouring out of that fluid into the cellular membrane, and may consist either of the ordinary kind, known as "a bruise;" or it may be in the lungs, constituting pulmonary apoplexy, 76 (*par.* 228); or in the brain, when it is either known as extravasation, in consequence of accident, 120; or as apoplexy, when it is the result of disease, 118, 119. For the treatment of the first of these, see *Bruises* or *Contused Wounds*; of the second, see *Pneumonia*; and of the third, see *Brain, Diseases and Injuries of the.*

EXTROPION (sometimes called *ectropion* or *ectropium*) is a condition of the eye-lids in which one or other is permanently inverted, 489.

EYE, Anatomy of the.—The organ of vision is to be considered by itself as an optical instrument, independently of the muscles which move its lids, of the orbit which protects it, and of the lachrymal apparatus which provides for its lubrication, and for the carrying off of the fluid necessary for that purpose into the nose. In this limited sense the eye or eye-ball may be described as a sphere about one inch in diameter, having the segment of a smaller sphere engrafted on its anterior surface, and this second sphere being perfectly transparent, while the other is of an opaque white, externally. This sphere or globe consists of an outer series of coats and an inner set of humours, each three in number. The coats are, commencing on the outside—the sclerotic and cornea (*a*); the choroid, iris, and ciliary processes (*b*), the retina (*c*). The humours are, beginning from the front—the aqueous (*d*); the crystalline lens (*e*); and the vitreous humour (*f*). See *Diagrams of the Eye*, *fig.* 1.

(*a*) *The sclerotic and cornea* together form a strong and somewhat elastic covering to the whole eye, the latter being closely attached to the former, in the same way as the glass of a watch is inserted in its metallic case. The sclerotic is white and fibrous, and in front is covered by a thin tendinous layer derived from the tendons of four muscles which move the eye, and called *tunica albuginea* from the glistening white colour which it gives to the "white of the eye." At the inner part of the back of the eye the sclerotic is perforated by a number of small openings, which give passage to the filaments of the optic nerve as it passes in to form the retina, and also to a small artery which supplies the retina with blood. The *cornea* is the transparent part of the outer coat that forms the anterior fifth of the globe of the eye. It is composed of four layers—namely, 1st, the conjunctiva; 2nd, of the proper cornea, consisting of areolar tissue; 3rd, of an elastic membrane, which is exquisitely transparent; and, 4th, of the membrane of the aqueous humour, which lines the whole chamber, and which secretes the fluid as it is wanted.

(*b*) *The choroid coat*, *iris*, and *ciliary processes* together constitute a vascular membrane of a deep colour throughout, but varied, as far as the front of the iris is concerned, according to the peculiar shade in every eye. The *choroid* is connected to the sclerotic, externally, by numerous vessels and nerves, and also by a fine areolar tissue. Internally, the retina lies in apposition with it, but without any further connection. It consists of three layers—an *outer*, composed chiefly of veins; a *middle*, made up of arteries; and an *internal* coat, which contains the *pigmentum nigrum*, or that black matter which is so remarkable a material in all eyes. The *iris* is so named from the rainbow-like variety of colour which it exhibits in different individuals; it forms an incomplete division between the anterior and posterior chambers of the eye, its middle being deficient, and known as "the pupil." The exterior of the iris is connected with the sclerotic and choroid coats by means of the ciliary ligament or circle; the internal margin (or edge of the pupil) is free; the anterior surface is washed by the aqueous humour, and the posterior lies against the *ciliary processes*. It is composed of two layers—1st, an anterior or muscular, which consists of radiating and circular fibres, the former of which dilate, while the latter contract, the pupil; 2nd, of a posterior layer, which is of a deep purple tint, and is called *uvea*, from its resemblance to a grape. The *ciliary processes* consist of a number of triangular folds about sixty in number, which radiate around the pupil and behind the iris. They are covered by a thick layer of *pigmentum nigrum*.

(*c*) *The retina* is composed of three layers:—1st, the external of Jacob's membrane, which is considered to be of a serous character; 2nd, the true nervous expansion; and 3rd, the internal or vascular expansion.

(*d*) *The aqueous humour* occupies the anterior and posterior chambers of the eye, to the amount of four or five grains in weight. It is

Fig 4.

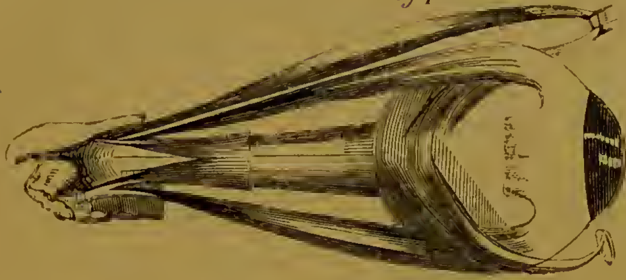


Fig 1.

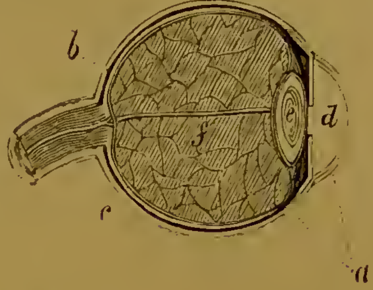


Fig 3.

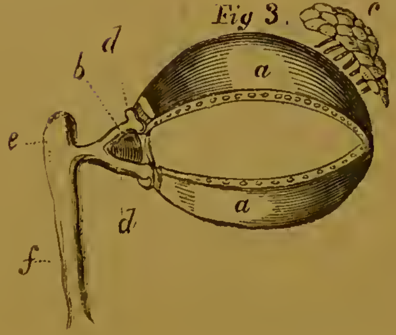
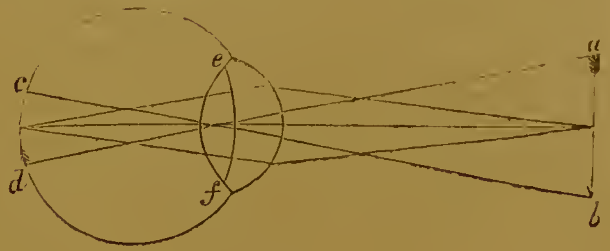


Fig 2.



DIAGRAMS OF THE EYE.

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very slightly albuminous, resembling water in all respects on a casual examination. The *anterior chamber* is the space between the back of the cornea and the iris and pupil, while the *posterior chamber* is that between the back of the iris and pupil in front, and the ciliary processes and lens behind. Both these chambers are lined by a thin membrane, already described as secreting the aqueous humour.

(*e*) *The crystalline lens* is situated about half a line behind the pupil, and is surrounded by the ciliary processes in front. It is more convex posteriorly than in front, and is imbedded in the vitreous humour. It is kept in its place by the *zonula ciliaris*, and is also invested by a transparent and elastic membrane called its capsule. The lens is made up of concentric layers, which may readily be seen in the boiled eye of a fish when brought to table. The centre is much firmer than the outside, which is of a semi-gelatinous consistence, the whole being composed of albumen.

(*f*) *The vitreous humour* forms the chief portion of the globe of the eye, being an albuminous fluid highly transparent, as also is the membrane which contains it, called the *hyaloid membrane*. This is so formed that it makes a series of irregular cells, in which the humour is contained, and which give it the appearance of a thick jelly, although the humour itself is comparatively liquid, as may be easily seen by breaking down the cells when it escapes in its natural consistency.

(*g*) *The nerves of the eye-ball* are the optic, besides two ciliary branches of the ophthalmic division of the fifth nerve, which is a nerve of sensation, and two branches from the ophthalmic ganglion, which is one of the grand series of sympathetic ganglia.

(*h*) *The vessels* of the globe of the eye are numerous in proportion to its size, and are derived from the ophthalmic artery, which emerges from the interior of the *cranium* through the back of the orbit, being a branch of the internal carotid.

(*i*) *The uses* of these various parts are as follows:—The *sclerotic* and *cornea* are the means of protection, the latter being made transparent to allow of the rays of light passing through. The *choroid* supports the vessels, while its pigment absorbs the loose and scattered rays of light which would otherwise confuse the image. The *iris* by its contractile power regulates the quantity of light admitted, and its posterior layer (the *uvea*), as well as the ciliary processes, prevent any light being transmitted through it. The *retina* is the nervous expansion upon which, as in a camera, the figure of the objects looked at is impressed, and which conveys the sensation to the brain through the medium of the optic nerve. Lastly, the humours and lens constitute a complete and perfect optical instrument for throwing that image upon the retina. For this purpose the rays of light, as they diverge from the several points of any object, and fall upon the front of the eye (cornea), are refracted by its convex surface whilst passing through it into the eye, and are made to converge slightly. They are brought more closely together by the crystalline lens, which they reach after passing through the pupil; and the refracting influence of this dense body, together with that of the vitreous humour occupying the space behind it, is such as to cause the rays issuing from each point to unite at a focus on the retina. In this manner a complete inverted image is formed, shown at *fig.* 2, which represents a vertical section of the eye, and the general course of the rays in its interior. Here the rays issuing from the point *a* are brought to a focus at *d*; while those diverging from *b* are made to converge at *c* upon the retina, which is itself so thin as to be nearly transparent, and, as already observed, is spread over a layer of black pigment intended to absorb the rays of light, and thus prevent a confusion of the image by a reflection of its points from one side to another of the receiving surface. Such is the simple account of the eye as an optical instrument; beyond which it may be considered as consisting of certain parts intended to keep the machine in order, and also to correct its otherwise irremediable defects. These are—1st, the means of accommodating the focus to near, as well as distant, objects; and 2nd, the appendages of the eye.

(*j*) *The accommodating power of the eye* is a very remarkable property, and one which should never be lost sight of by those who have the management of young persons who are afflicted with short sight. We have not been able to ascertain with any certainty the exact nature of the contrivance by which this is effected, but that it exists is shown from the known powers of the eye, and from the nature of its mechanical structure. According to the laws of optics, the picture of a near object can only be distinct when formed at a greater distance behind the lens than the picture of a distant object. Consequently, when an eye can see both a near and a distant object equally clearly, without moving its situation as regards them, and in a very short period of time, it follows that the instrument itself must have been altered in some one or more of its diameters or surfaces. It is considered highly propable that in the human eye the lens is brought backwards and forwards, according to the distance of the object; but this is merely a theory propounded as the most likely of the many which have been advanced, and not as being capable at present of distinct proof. It is upon the existence of the power of accommodation that any improvement in the short or long sight can be expected; but with a knowledge of the possibility of its being called into play, no one should give glasses to a young person until they had tried how far his sight might be improved by its education. All short-sighted persons, however marked their defect, may, by perseverance in using their eyes at the utmost limit of their powers, call the accommodating power into play, and in process of time it will most materially aid them. It is in this way that the mariner is enabled to discern ships or other objects at a vast distance beyond that at which they are visible to an ordinary person; and in the same way, a microscopist educates his eye until it accustoms itself to see minute objects, which defy the scan of the unaccustomed organ of vision. See *Treatment of Shortsight*, 333.

(*k*) *The laws which regulate the transmission of light* are as follows:—

I.—Light travels in straight lines so long as the medium through which it passes is of uniform density.

II.—When the rays of light pass from a rarer medium into a denser one, they are refracted *towards* a line drawn perpendicularly to the surface they are entering.

III.—When the rays of light pass from a denser medium into a rarer one, they are refracted *from* the perpendicular.

IV.—When rays proceeding from the several points of a luminous object at a distance fall upon a double convex lens, they are brought to a focus upon the other side of it in such a manner that an inverted picture of the object is formed upon a screen placed in the proper position to receive it. Thus, in *fig.* 2, *a b* is the object, and *c f* the lens; the rays issuing from the two extremities, and the centre of the object, are brought to a corresponding focus at a less distance on the other side of it, so as to form a distinct picture; but as the rays from *a* are brought to a focus at *d*, and those from *b* at *c*, the picture will be inverted.

V.—The further the object is removed from the lens, the nearer in proportion will the picture be brought to it, and the smaller will it be.

VI.—If the screen be not held precisely in the focus of the lens, but a little nearer or further off, the picture will be indistinct; for the rays which form it will either not have met, or they will have crossed each other.

EYE, Appendages of the.—These comprise—1st, the eye-brows; 2nd, the eye-lids and eye-lashes; 3rd, the conjunctiva; 4th, the caruncula lachrymalis and meibomean glands; and 5th, the lachrymal apparatus for the formation and carrying off of the tears.

(*a*) The *eye-brows* are the arches of hair which are intended to shade the eyes from too vivid a light, as well as partly from dust and from the drops of perspiration which form on the forehead.

(*b*) The *eye-lids* and *eye-lashes* are two valves, protected by hair at the edges, which, when in apposition, leave a small triangular canal leading from one corner of the eye to the other. They each contain a layer of fibro-cartilage (see *fig.* 3, *a a*).

(*c*) *The conjunctiva* is a portion of mucous membrane covering the front of the eye, and reflected from it upon the lids which it lines. Where it covers the cornea, it is very thin and transparent.

(*d*) *The caruncula lachrymalis* and *meibomean glands* are small follicles intended to supply a protecting mucus for lubricating the surface of the eye. The former is situated at the internal angle, where it forms a small reddish body (see *b*, *fig.* 3), while the latter are arranged in parallel lines on the inside of the lids, and open at their edges, as shown in the figure.

The lachrymal apparatus consists of the *gland* (*fig.* 3 *c*) which secretes the tears, and is placed at the upper and outer part of the orbit. It is furnished with several short ducts which open on the surface of the conjunctiva, and through which the tears reach the eye, and when it is open bedew its surface or run over the lids, while if closed they flow along the triangular canal (which has been alluded to in describing the lids) to the inner corner, where on each lid is a small opening of the diameter of a fine horse-hair, which is the commencement of a small canal (the two *lachrymal canals d d*). These again terminate in the *lachrymal sac* (*e*), which is above the *nasal duct* (*f*)—a short tube leading to the nose. All these parts are lined by mucous membrane, which is continuous with the conjunctiva, and which is subject to inflammation in common with it. A stoppage in any part causes the tears to flow over the cheek, and creates great irritation and annoyance.

EYE, Motions of the.—The eye is moved by six muscles, four of which, called the *recti* muscles, are employed to raise, lower, adduct, or abduct the eye; while two others, called the *superior* and *inferior oblique*, have the property of rolling it on its axis. (See *diagram of the eye, fig.* 4; in which the *external rectus* is cut away to show the attachments to the eye of the two *oblique muscles*.)

EYE-BALL, Symptoms of diseases of the, 162 *et seq.*—as common acute ophthalmia, 162; chronic ophthalmia, *ib.*; purulent ophthalmia, *ib.*; strumous ophthalmia, *ib.*; ulcerated cornea, 163; stained white of the eye, *ib.*; rheumatic inflammation, *ib.*; inflamed iris, *ib.*; cataract, *ib.*; glaucoma, *ib.*; inflammation of the choroid, *ib.*; dropsy, *ib.*; floating objects, *ib.*; amaurosis, *ib.*; short and long sight, *ib.*; squinting, *ib.*; cancer, *ib.*

EYE-BALL, Treatment of diseases of the, 489 *et seq.*—as common acute ophthalmia, 489; chronic ophthalmia, *ib.*; purulent ophthalmia, *ib.*; and in infants, 279; strumous ophthalmia, 489; and in children, 332; ulceration of the cornea, 490; rheumatic inflammation, *ib.*; inflammation of the iris, *ib.*; cataract, *ib.*; glaucoma, *ib.*; inflammation of the choroid coat, *ib.*; dropsy, *ib.*; floating objects, *ib.*; amaurosis, *ib.*; short-sight and long-sight, *ib.*; and in children, 333; squinting, 490; and in children, 333; cancer of the eye, 490.

EYE-LIDS, Symptoms of diseases of the, 161 *et seq.*—as a stye, 161; redness of the edge of the lids, 162; granular lids, *ib.*; inversion of the hairs, *ib.*; entropion and extropion, *ib.*; falling of the upper lid, *ib.*; encysted tumours, *ib.*; overflowing of tears, *ib.*

EYE-LIDS, Treatment of diseases of the, 488 *et seq.*—as stye, 332, 488; redness of the edge of the lids, 488; granular lids, *ib.*; inward growth of the eye-lashes, *ib.*; entropion and extropion, 489; dropping of the upper lid, *ib.*; encysted tumours and nœvi, *ib.*; abscesses of the lids after small-pox or erysipelas, *ib.*; defects in the lachrymal apparatus, *ib.*

EYE, Treatment of diseases of the, in children—as purulent ophthalmia of the new-born child, 279; a stye, 332; strumous ophthalmia, *ib.*; squinting, *ib.*; shortness of sight, *ib.*

EYE, Appearance of the, as symptomatic of disease. This may be (*a*) bloodshot, (*b*) contracted pupil, (*c*) dilated pupil, (*d*) intolerance of light, (*e*) prominent, (*f*) smarting, (*g*) squinting, (*h*) watering, (*i*) yellow.

(*a*) *A bloodshot eye* is a symptom either of local inflammation, or congestion, or extravasation of blood in the organ itself; or of common catarrh or influenza, but especially of measles.

(*b*) *Contracted pupils* are evidence of some serious mischief in the brain, which may be compression, or hydrocephalus, or sometimes the consequence of taking large doses of opium.

(*c*) *Dilated pupil* occurs in various diseases of the brain, and in amaurosis, 163. It also comes on after comparatively small doses of opium, and is specially caused by belladonna or atropine, if applied locally to the eye.

(*d*) *Intolerance of light* is met with in fevers, inflammation of the brain, severe headaches, and especially in strumous ophthalmia, 162.

(*e*) *Prominence of the eyes* is a symptom of some obscure organic disease, often of the heart or brain; or it may consist in dropsy of the eye itself, 163.

(*f*) *Smarting of the eyes* occurs from acute ophthalmia, 162; or in that stage of measles in which they are suffused.

(*g*) *Squinting* may be a chronic condition of the muscles of the eye; but when it comes on in the course of any disease, it is a symptom of serious mischief in the brain, which is most probably effusion of serum or blood, as in hydrocephalus and apoplexy.

(*h*) *Watering of the eyes* is a symptom of influenza when acute, or when chronic of some impediment to the flow of the tears into the nose.

(*i*) *Yellowness of the white of the eye* indicates that the liver is not acting, and accompanies or precedes jaundice.

FACE-ACHE.—See *Neuralgia* and *Toothache.*

FÆCES are the natural excrement of the body, passing from the bowels daily when the health is perfect. Their appearance is generally indicative of the state of the whole system, and therefore they should be examined with that view. They may be either (*a*) natural, or (*b*) mucous, (*c*) mixed with shreds of lymph, (*d*) with pus, (*e*) bilious, (*f*) deficient in bile, (*g*) too loose, (*h*) too solid, (*i*) entirely watery, (*j*) offensive.

(*a*) *Natural motions* are of a dark ginger-bread colour, figured, but not perfectly solid. The smell is too well known to need description. They should be passed at regular intervals, and on the average occur once a day; but a variation from this in point of greater or less frequency is no proof of a deviation from health, if it is the constant habit of the individual. Thus, some people in perfect health are accustomed to pass their evacuations twice a day, while others have been known to have a motion only once a week, or even once a fortnight; but these are exceptional cases, and as a rule it may be assumed that a daily evacuation is a proof, as far as it goes, of good health, while the reverse will lead us to suspect some deviation from it.

(*b*) *Mucous evacuations* have the appearance of a semi-transparent jelly, which may be variously coloured, as for instance, with brown, green, or yellow, when bile is passing; or with blood, if the inflammation or congestion of the mucous membrane is sufficient to cause its being poured out. See *Mucous Diarrhœa and Dysentery*, 53.

(*c*) *When fæces are passed mixed with shreds of lymph*, there is reason to suspect most acute inflammation of the mucous membrane of the intestines, which may be confined to the rectum, or may be seated in any of the bowels. The appearance is very peculiar, being similar either to little irregularly round specks of white of egg, stained with the colour of the fæces; or when of a larger size, being only to be compared to rough shreds of parchment, also stained with the prevailing colour. See also *Diarrhœa and Dysentery*, 52, 53.

(*d*) *Pus*, when passed either alone or mixed with fæces, is an evidence either of ulceration of the bowels, or of an abscess having broken into them. The quantity is the chief guide in distinguishing between the two; for if an abscess is the cause of the mischief, there is generally a larger amount of pus than when it is due to some limited extent of ulceration. In any case, it is a most dangerous symptom.

(*e*) *Bilious motions* are evidence of excessive action of the liver, which may arise from various causes, and may exist to the extent of producing a deep green, as in the peculiar *fæces* of hydrocephalus, 121, or in other states of irritation or active congestion of the liver, 99. Here it is generally of a bright yellowish brown, but in children especially it is often of a decided green colour. These bilious motions may or may not be loose, but they are generally so from the irritation produced by the bile. Dark green motions, occurring independently of hydrocephalus, are generally met with after the liver has been for some time torpid, and is just beginning to act with unusual violence.

(*f*) *Fæces which are deficient in bile* are pale, or of a pipe-clay colour, or of any shade between that and the natural hue. Sometimes they assume a greyish shade, but the usual one is as above described. They may be solid, or semi-solid, or liquid, in which case they are generally frothy from the disengagement of gas, and from that circumstance when passed into water they float on its surface.

(*g*) *Loose motions* arise from various causes. See *Diarrhœa*, 53.

(*h*) *Motions, when too solid*, give rise to *constipation*, which see.

(*i*) *When the evacuations are entirely watery*, there is evidence of that form of *diarrhœa*, 53; or when mixed with rice-like particles, of Asiatic cholera, 55; or they may be the result of saline or drastic aperients, which have that effect.

(*j*) *Offensive motions* are met with in some forms of dyspepsia, especially in those associated with hypochondriasis, 152. Here it appears that there is an undue formation of putrescent matter in the system, which, by tainting the blood, causes its action on the brain to become unhealthy. An excessive fetor in the evacuations is also characteristic of low fevers, in which the whole of the solids and fluids of the body seem to have an unusual tendency to decomposition in consequence of the introduction of a poison which acts as a kind of ferment, from which the system attempts to free itself by the various organs of secretion. See *Typhus Fever*, 25.

FAINTING, Nature and symptoms of, 116; treatment of, 457.

FALLING SICKNESS.—See *Epilepsy*.

FANGS of the Teeth, treatment of inflammation of the, 492.

FARINACEOUS.—Of or relating to flour, on to the meal of any kind of corn.

FARINACEOUS FOOD for Infants. Of the various kinds of flour sold under this name, Hard's is the most generally known; but all are composed of wheat-flour more or less pure, and *baked* or mixed with bean or potato-flour, which is no improvement. The price is generally three or four times that of the finest and most genuine flour, and therefore, as baking generally costs a mere trifle, the public are imposed upon to an enormous extent, and may readily furnish themselves with an equally good article at one-third the cost. *Tous-les-mois* is only another kind of farinaceous food, consisting generally of wheat-flour mixed with inferior arrowroot. It is said to be prepared from the pith of the *canica coccinea.*

FASTING.—See *Abstinence.*

FAT, as found in the body of man, is composed of cells which have the property of appropriating the fatty matter contained in the blood. The chemical composition of this fat varies in different animals according to the relative proportions of their component substances, known as stearine, margarine, and oleine. All of these are neutral compounds of stearic, margaric, and oleic acids, with glycerine. They contain no nitrogen, and their proportion of oxygen is small compared to their carbon and hydrogen. They are abundantly supplied by the vegetable kingdom, and there is, consequently, no transformation to be performed in the animal economy when vegetables form the chief article of diet. The development of fat in the body appears to answer several distinct purposes—1st, it fills up interstices, and forms a kind of pad for the hard points of the various parts of the skeleton; 2nd, it retains the temperature by its non-conducting power; and, 3rd, it serves as a reservoir of combustible matter, which will keep up respiration when other materials are deficient, for which purpose, however, it must be taken back again into the blood. Fat is formed almost entirely at the expense of the non-azotised constituents of the food, the walls of its cells being alone composed of any of those compounds called proteine. Matters already of an oily nature are of course easily added to the collection of fat, but sugar and starch are also readily converted into this substance. But this cannot occur unless there is in the food a larger quantity of these materials than is required to maintain the heat of the system by the respiratory process; consequently, whatever increases the demand for heat diminishes the deposition of fat, and, on the contrary, warmth is favourable to its increase. It is a well-known fact that some animals have a much greater tendency to fatten than others, and this applies to certain breeds as well as to individuals. So in the human race, some families, and also single members of others, are found to make fat, in spite of all precautions; and among the various nations of the world, few are more inclined to this habit of body than John Bull and his wife.

FAT, Removal of.—Many cases are constantly met with in which the tendency to lay on fat is so great as to interfere with the comforts of life, and where no pains would be spared to get rid of the accumulation, if it could be done without injury to the system. A sufficient amount of exercise, joined with a spare diet, will bring the fattest person down to any standard of leanness, supposing the organs sound, and the limbs capable of bearing the extra weight; but very often the reverse is the case, and, when the body is much overloaded, the legs and feet will not "stand" one quarter of the work necessary to effect the object. In such cases as these, it has been proposed to effect by diet alone what the state of the limbs forbids to be accomplished by the double powers of exercise and regimen; and at the present time a French physician is engaging to relieve any one of his superfluous fat by simply attending to his dietetic directions. His plan is to avoid all fatty, starchy, and sugary articles, and to feed on lean meat and bread, with haricot beans; but granting that this may be effectual with Parisian meat, which is somewhat deficient in fat, it will not do with the produce of the rich pastures of England, especially with the beef and mutton fed on oil-cake, and containing a large proportion of fatty matter mixed with the lean. Very often in conjunction with this tendency to general fat, there is a local degeneration of the heart, which becomes weakened by an intermixture of fatty matter with its muscular fibres, and then remedies which lower the system are attended with considerable danger. It is necessary, therefore, to be quite sure that this organ is sound, and, indeed, that all the principal viscera are in a tolerably healthy condition before beginning to submit the body to such restraining rules as will certainly remove the fat, but will also often reduce the strength in a still greater proportion. But when it is supposed that the health will admit of it, the best plan to pursue is to proceed, in great measure, upon the method (which is no novelty) advocated by the French physician above alluded to. About four or five ounces of plain roast or boiled *lean* meat may be taken twice a day, with six or eight ounces of bread, and a cup of weak black tea without sugar, or a glass of soda-water with a little brandy in it. If the stomach is very craving at other times, half a captain's biscuit may be allowed, and a repetition of the soda-water and brandy, which is the best kind of beverage for the purpose. This limitation of the quantity of food should not be attempted all at once, but it should be aimed at as the final allowance when the system is gradually inured to it. It will not nearly suffice for those who take exercise; but it will be enough for those who are unable to do more than walk gently for a mile or so per day, and especially after a gradual breaking in of the stomach to the restricted allowance. If it is found that more must be taken, from five to ten grains of rhubarb made into pills should be swallowed with the two principal meals, so as to hurry the food through the stomach and bowels, and thus avoid, to some extent, its conversion into fat there and its absorption into the blood from the bowels. When the body is reduced to some extent in weight, it will often be found that the limbs are rendered capable of taking exercise; and if this can be effected, a more liberal allowance may be established, but the patient should weigh himself every day, and increase his exercise or diminish his food if he gains in weight. The chief difficulty is in carrying out the directions given, and not in laying them down, which is a matter simple enough.

FAUCES.—The back of the mouth, being the space between the back of the tongue and the upper part of the *pharynx*. This is bounded above by the uvula and arches of the *palate*, and below by the *root of the tongue* and the *epiglottis*.

FAVUS.—See *Porrigo*, or *Scall'd Head*, 67.

FEBRIFUGE.—A medicine calculated to relieve fever. See *Antiphlogistic*, 342.

FECULA.—See *Starch*.

FEEDING of Infants, 281.

FEMORAL ARTERY.—The principal artery of the thigh, which extends from the groin to the inner part of the thigh, four or five inches above the knee, where it passes backwards to enter a triangular space behind the knee, called the *popliteal space*, and where it is called the popliteal artery. In this course it is capable of being compressed when any of its branches bleed, either as it passes from the groin, where its pulsations may be readily felt, or about six inches lower down, where it begins to wind round the thigh-bone. See *Hemorrhage*.

FEMUR.—The thigh-bone. See *Skeleton*.

FEMUR, Symptoms and treatment of

dislocations of, 422, 423; symptoms and treatment of fractures of, 438, 439.

FERMENTATION.—The explanation of this process propounded by Liebig, though purely hypothetical, is very generally believed to be a true one—at all events, it is accepted for want of a better and clearer explanation of what is, after all, perfectly unintelligible. It has long been known that one of the most indispensable conditions of fermentation is the presence in the fermenting liquid of some azotised substance, whose decomposition proceeds simultaneously with that of the body undergoing the change. This substance is called a *ferment*, of which there are several, all being composed of albumen in some shape, which in a moist state has a natural tendency to putrify and decompose spontaneously. Liebig imagines, therefore, that "when these substances in the act of undergoing change are brought into contact with neutral ternary compounds of small stability, such as sugar, the molecular disturbance of the one body (the ferment) already in a state of decomposition is, at it were, propagated to the others, and this brings about a destruction of the equilibrium previously existing." But leaving theory out of the question, it is certain that decomposing azotised bodies (ferments) not only possess energetic powers of exciting fermentation, but that the *kind* set up is mainly dependent on the stage of decomposition in the ferment. The kinds of fermentation are various; but those with which we are most familiar are (*a*) the alcoholic or vinous, and (*b*) the acetic.

(*a*) *Alcoholic or vinous fermentation* is the result of the action of an azotised ferment on any saccharine solution. Pure sugar dissolved in water, and kept in an open or closed vessel, remains unchanged for any length of time; but on the addition of any putrescible azotised matters in the proper stage of decay, the sugar is converted into alcohol, accompanied by an escape of carbonic acid gas. Blood, or white of eggs, or flour-paste when putrid, will all effect this change; but by far the most potent alcoholic ferment is *yeast*, which is the insoluble, yellowish, viscid matter deposited from beer in a state of fermentation. Wine, beer, &c., owe their intoxicating properties to the alcohol which they contain, the proportion of which to the watery particles varies greatly in them. Port, sherry, and some other strong wines, contain from 19 to 25 per cent.; while in the lighter wines of France and Germany, it sometimes falls as low as 12 per cent. Strong ale contains about 10 per cent., and ordinary spirits 40 to 50 per cent. In making wine from the grape, the expressed juice is simply set aside in large vats, where it undergoes spontaneously the necessary change. The vegetable albumen of the juice, which is an azotised compound, absorbs oxygen from the air, runs into decomposition, and in that state becomes a ferment to the sugar, which is gradually converted into alcohol. If the sugar be in excess, and the azotised matter deficient, the resulting wine remains sweet; but if, on the other hand, the proportion of sugar be small and that of albumen large, a dry wine is produced. Vinous or alcoholic fermentation has always a tendency to go on to the acetic, and in course of time all alcoholic compounds, not being pure alcohol and water, have a natural tendency to assume the acetic fermentation, and hence all wines turn sour with age.

(*b*) *Acetic fermentation* is the result of the addition to alcoholic solutions of more oxygen, which is gradually absorbed from the air in the usual process of making vinegar, or more rapidly by the modern quick method which is now much adopted. The entire exclusion of air, therefore, in great measure, prevents this change; and for this reason, wines and other fermented liquors are obliged to be kept carefully corked.

(*c*) *In the fermentation of bread* when sweet, the alcoholic stage only is reached, but sometimes more oxygen is absorbed, and acetic acid is partially formed, or in other cases lactic acid, which is another result of putrefactive fermentation. Milk, also, when fermented, develops lactic and butyric acids.

FERMENTED LIQUORS, in ordinary language, include all those of which alcohol forms the essential principle, such as *brandy*, *rum*, *gin*, *hollands*, *whiskey*, *cordials and liqueurs*, *malt-liquors*, *cyder*, *perry*, and *wines* (foreign and home-made). These are all stimulant to the system, in proportion to the amount of alcohol contained in them; but many of them are cordial and stomachic also, depending upon the essential oil, or upon the extractive matters dissolved in the liquid. The properties of the several fermented liquors are much affected by these substances held in solution and not converted into alcohol; and in some liquids, as beer, porter, &c., they preponderate greatly, and afford considerable nourishment to the body as well as a mere temporary stimulus to the nervous system and circulation. Hence their temperate use has always been encouraged, except by those who think it better that all should be deprived of a useful friend than that any should be allowed to make their friends into enemies. Intoxication, however, is a fearful vice; and when we see it carried to the extent which it is, it can scarcely occasion surprise that benevolent men should be anxious to put a stop to this habit by any means, however stringent. (See each of the above articles.)

FERN, Male.—Used as a worm medicine, 331.

FERRUGINOUS.—Relating to iron (*ferrum*).

FETOR.—By this term is generally understood the peculiar odour which is given out by putrefactive decomposition; but it is also sometimes applied to any foul smell.

FETID BREATH is a symptom of disease of the lungs, or of carious teeth, or of certain forms of dyspepsia generally occurring in those who eat more rich animal food than their systems require.

FEVER, Characteristics of, 23; varieties of, *ib.*—as continued, *ib.*; periodic, 27; eruptive, 31; incidental to child-birth, 169; treatment of general, 350.

FEVERS, Special, symptoms of, 24 *et seq.*—as simple or ephemeral, 24; typhus, *ib.*; intermittent or ague, 27; adult remittent, 28; yellow fever, 29; infantile remittent, *ib.*; hectic, 30; small-pox, 31, 33; cow-pox, 33, 36; chicken-pox, 37; scarlet fever, 38, 40; plague, 40; miliary fever, *ib.*; sympathetic or inflammatory fever, 44.

FEVERS, Special, treatment of, in the child, 298 *et seq.*—as ephemeral fever, 298; typhus and intermittent, *ib.*; infantile remittent, *ib.*; small-pox, 300; cow-pox, *ib.*; chicken-pox, *ib.*; measles, *ib.*; scarlet fever, 301.

FEVERS, Special, treatment of, in the adult, 351 *et seq.*—as simple or ephemeral, 311; typhus, 352, 356; ague or intermittent, 356; adult remittent, 357; yellow fever, 359; hectic, *ib.*; small-pox, 360; chicken-pox, measles, and scarlet fever, 361; plague, 362; miliary fever, *ib.*; sympathetic or inflammatory, 369.

FIBRINE is a constituent of the body of man in common with all animals. It is found in solution in the blood, and in a solid state in the muscular and fibrous tissues. To procure it, a clot of blood should be washed in water until all the soluble particles are removed, or fresh blood should be agitated with a bundle of twigs, to which the fibrine sticks, and is then easily removed and freed from all admixture of other substances by washing in water, and afterwards digesting in ether to remove the fat. In the first state, fibrine thus prepared forms long white elastic filaments, tasteless and insoluble either in hot or cold water. The fibrine obtained from arterial blood differs slightly from that of the veins, which more nearly resembles albumen. When contained within living vessels, fibrine is suspended in the serum; but on withdrawing it from the influence of life it coagulates spontaneously, giving rise to the production of a clot or *coagulum*, which consists of a fine network of its fibres swollen with serum, and inclosing the red particles of the blood in its meshes. Fibrine is composed as follows:—

Carbon	52·7
Hydrogen . . .	6·9
Nitrogen . . .	15·4
Oxygen	23·5
Phosphorus . .	0·3
Sulphur	1·2
	100·0

FIBROUS TISSUE, Structure of, 85; symptoms of inflammation of, 86 *et seq.*—as mechanical injuries, 87; gout, *ib.*; rheumatic inflammation of, 88 *et seq.*

FIBROUS TISSUES, Treatment of inflammation of, in children, 316; treatment of inflammation of, in adults, 413 *et seq.*—as gout, 413; rheumatism, 415; strains and sprains, 418, 419; dislocations, 419 *et seq.*

FIBULA.—The small bone of the leg. See *Skeleton.*

FIBULA, Treatment of fractures of the, 437.

FIELD SPORTS, Use and importance of, 12.

FIGS are sometimes given to children with a view to relieve constipation.

FILBERTS are, like all nuts, very indigestible, and should only be eaten by those who have strong stomachs.

FILTERS are used for separating from liquids certain substances which are suspended in them. Thus, tinctures are passed through a filter in order to get rid of those matters which are quite useless, and which impair their transparency, such as the dust and dirt adhering to their component articles, &c. Blotting-paper is generally employed for the purpose, or sometimes flannel, or even a lump of tow placed in the bottom of a funnel, will be sufficient. If blotting-paper is employed, a square is taken and folded from corner to corner twice, and then again folded twice, so as to diminish the first triangle and make the whole when opened sit in ridges; after which it is put into a porcelain or glass funnel, and the tincture poured in. For the filters used in purifying *water*, see article *Water*.

FINGERS, treatment of dislocation of the, 421; of fractures of the, 433; to remove a ring from, see *Ring-bound Finger*.

FINGER-NAILS of Children, cutting of, 309.

FIRE.—See *Caloric* and *Grates*.

FISH.—An article of diet much used in the sick-room, some being quite as digestible, and yet not nearly so heating as animal food. It is certainly not so strong and nutritious as butcher's meat, or even poultry, but many kinds are sufficiently nourishing to preserve health, in conjunction with potatoes and meal; and when taken alternately with meat or bacon, fish seems to agree remarkably well with most constitutions. In our summers and in warm climates, fish is particularly well suited to the wants of the system, inasmuch as it contains less stimulating properties than butcher's meat; but, at the same time, it must not be forgotten that it requires a larger quantity of it to satisfy a hearty appetite, and that, being rapidly digested, it will not "stay" the stomach long before the next meal. Fishes have been used as the food of man from the earliest ages, and Aristotle and Pliny wrote elaborate treatises on their characters and habits. Since their time, however, many succeeding writers have developed our knowledge of the structure of these creatures, and they are now arranged in natural groups according to their internal formations. All true fish have cold red blood, with a skeleton either of bone or cartilage; and they all renovate the oxygen in the blood by means of gills, which bring that fluid into near contact with the air contained in the water they inhabit.

They live but a short time out of the water, though some, as the eel and carp, can maintain life in the air for a considerable number of hours. The composition of the skeleton is one chief ground of subdivision, inasmuch as one division or group have bony, and the other cartilaginous skeletons. These, again, are subdivided to an enormous extent by various distinguishing traits, as the existence or not of the gill-cover, which separates the cartilaginous fishes into two sections, including in those which want this addition the lamprey, lampern, skate, and shark, whilst the eel and the sturgeon possess it tolerably well developed. The bony fishes are divided into orders, from the situation of the fins, which with the tail are their only organs of motion. These vary their position in a remarkable manner, as for instance, in the eel-pout and haddock, which have the ventral fins placed before the pectoral, whilst they are directly under them in the bream, the perch, and the mackerel, and behind them in the salmon, pike, herring, and carp. The muscles of fish are somewhat different from those of warm-blooded animals, consisting of white or pale layers of fibrous tissue, of a thicker texture than those of mammalia, and having between them layers of a white gelatinous substance, which rapidly decomposes after death. The brain and nervous system are small in comparison with the size of the body, and the ganglia are very much separated from one another. Hence it is argued, with some degree of probability, too, that they are not capable of feeling so acutely the lacerations and other injuries to which they are subjected; and this is a very important point for consideration when it is remembered how some of them are cut in crimping; others skinned alive, like the eel; others, again, are boiled to death, by putting them first in cold water, as is done with the lobster and crab, to prevent them throwing off their claws. The organs of seeing and smelling seem perfect enough; but the senses of taste and hearing are at a very low ebb, none but the cartilaginous fishes having even an external opening to the ear at all. Most of this tribe lay their eggs by spawning, which are afterwards hatched, and produce young fish; but some of the cartilaginous fishes are viviparous. Their productive power is very great—some, as the codfish, having been known to contain nearly a million and a half of eggs. For the purposes of human food, fish may be considered under five heads—(*a*) *river-fish*; (*b*) *pond-fish*; (*c*) *wet sea-fish*; (*d*) *shell-fish*; and (*e*) *dried and salted fish*.

(*a*) *River-fish* comprehend the *salmon*; the *salmon* or *sea-trout*; the *bull-trout*, *sewen*, or *whitling*; the *common trout*; the *grayling*; the *pike* or *jack*; the *bream*; the *roach*; the *dace*; the *barbel*; the *gudgeon*; the *perch*; the *ruffe* or *pope*; the *flounder*; the *eel*; the *lamprey* and *lampern*; and the *shad*. The parr, minnow, loach, stickleback, bullhead, and bleak, are river fish, but are not fit for the table, either from their want of size or flavour, and the sturgeon, rudd, and azurine, are too rare to need description here. Of this list, the trout, grayling, perch, pike, and eel only are fit for invalids, or for those whose stomachs are at all weak in their powers of digestion. The last-named is very commonly selected in many localities as the first article of diet to be used in convalescence; but it is of such a rich and oily nature that few patients can take it with impunity, even when plain-boiled, which is the method of cookery adopted under the circumstances. Salmon and salmon-trout are very well calculated for the food of healthy persons, but should be rigidly excluded from the sick-room.

(*b*) *Pond-fish* are met with in ponds and other still water, as lakes and torpid rivers, but do not thrive well in any situation where they are exposed to rapid changes of water, as in quickly-running streams. These fish may be reared to a proper age in ponds, where they may be kept till they are wanted; and, as they are generally only there preserved for the use of the proprietor of the water, and can be taken at any time by the net cast and drawn through the pond, they very seldom find their way to the fishmongers' stalls. They consist of the *great lake trout*, the *char*, the *gwiniad*, *powan*, *vendace*, and *pollan*, the *carp*, and the *tench*. Of these, the first and last named are the only ones fit for invalids; the carp requiring the addition of such wines and sauces as to make it far too rich for delicate stomachs.

(*c*) *Sea-fish* are of far more importance to the invalid, as well as to the healthy subject, than the various river and pond-fish, which have been already described. Some of them are wholesome even to the most delicate stomach, and form very economical articles of diet for all classes, being also advantageous to health when used alternately with meat; or when employed alone by the very poor, they may be considered as superior to potatoes and buttermilk, and as constituting a good change from oatmeal porridge. Sea-fish are now brought to all our large cities in immense quantities, and London is supplied from a variety of sources with hundreds of thousands of tons per annum. Indeed, it is notorious that in the metropolis fish may be generally bought more cheaply than at the sea-side where it is caught. unless there happens to be such a glut there that the means of carriage are not at once available. Billingsgate is the only wholesale fish-market in London, and it is now tolerably well adapted to the object for which it is intended, having been rebuilt in 1851-52. It consists of two storeys, an upper one level with Thames Street, where the ordinary kinds of fish are sold, and another beneath this devoted entirely to the sale of shell-fish. Here all the fish intended to supply at least four millions of people is daily offered for sale, beginning at three o'clock in the morning, and the market being over by eight, or nine at the latest. The fish are consigned to salesmen, who fix the price according to the supply, and also to the demand, and thus on two consecutive days the same kind of fish may vary at least 100 per cent The four millions above alluded to comprise the population of London and its suburbs, and also the many inland towns of the south of England, which depend upon Billingsgate for their fish supply. A great proportion of these fish is brought up by rail, chiefly by the Eastern Counties line, from the Yarmouth district; but the others also contribute their quota, the Great Western conveying large quantities from the Devonshire and Cornish fisheries. These have all to be conveyed in vans from the stations to Thames Street, where they may be seen in the early morning blocking up the entire street. On the river side, again, are to be seen every variety of small rowing and sailing boats disgorging their cargoes, and some of them selling their fish direct to the retailers without the intervention of the fish-salesmen in the market. Peter-boats, smacks, barges, wherries, and even steam-vessels crowd the wharf, and the apparent confusion is beyond the conception of those who have not witnessed the scene. With so perishable an article, and so short-lived a market, great exertions must often be made to reach the scene of operation; and as the sailing vessels are often unable to manage the feat, they employ a set of watermen to row up their cargo in large wherries from the point where they think it necessary to make up their minds to the extra expense incurred by a shift of wind. The fish, whether brought by railway or boat, are from widely separated fisheries. The cod-fish are from Holland, Norway, and the coast of Yarmouth; as also are the turbot, brill, sole, plaice, skate, haddock, and whiting. Mackerel come from Devon and Cornwall; herrings and sprats from various parts of the coast, according to the season, but chiefly from the eastern coasts. Dover is celebrated for its soles, but few of those called by that name are really from that limited locality. Shell-fish do not all come from the same coast, oysters being brought from the Thames and the Channel, lobsters from Norway and the coast of Scotland, crabs from the south coast, and shrimps and prawns from the estuary of the Thames and the south coast of Devonshire. These fish are kept alive in wells made in the vessels which bring them; and those which are otherwise conveyed are kept fresh by means of ice, vast quantities of which are thus consumed. In this way the fish sold at Billingsgate are brought to market, and classed as *wet-fish*, *shell-fish*, and *dry-fish*. The *wet-fish* sold in London, besides the salmon, eels, flounders, &c., already alluded to, comprise the following, viz.:—turbot, soles, brill, plaice, codfish, haddock, herrings, mackerel, whiting, sprats, whitebait, mullet, skate, and smelts. Besides these maybe enumerated the pilchard, the gurnard, the conger-eel, the halibut, and the ling, which are seldom carried far from the places where they are brought to land the first being a bad traveller, and the others being scarcely worth the cost of carriage. In this long list, soles, cod-fish, haddock, and whiting may be selected as the most digestible and fit for any invalid stomach; while turbot, brill, and plaice, mackerel, herrings, and smelts may be said to come next, being wholesome and full of nourishment for those who enjoy good health, but too rich for the invalid.

(*d*) *Shell-fish*, with the exception of oysters, are excluded from the sick-room, though they are highly prized by the lovers of suppers and luncheons, and by those who depend upon their lobster or shrimp-sauce for bringing out the flavour of their turbot. The trade was formerly dependent upon the state of the wind, but in these days of screw-steamers and railways, oysters, lobsters, &c., are brought to market as regularly as vegetables to Covent-garden. All shell-fish are very liable to decomposition, and when this takes place they are very injurious to the health, frequently producing severe bilious derangement, and in some cases a tremendous eruption similar to nettle-rash, 61. They are, however, when quite fresh, easily digested by sound stomachs; but they are never suited to invalids, with the exception of the oyster, which is light and yet nourishing, and can often be taken by them in preference to any other kind of animal food. The list of shell-fish comprises—oysters, lobsters, crabs, crawfish, prawns, and shrimps, periwinkles, mussels, whelks, and cockles. As before remarked, oysters are alone suited to the invalid, and for certain purposes they are well adapted in illness, such as to form a light supper in chronic diseases; or sometimes in the early stage of convalescence from acute diseases, one or two oysters may be ventured on by way of an experiment. Lobsters and crabs are quite out of the question as articles of *invalid diet*. The turtle, though not a shell-fish, is sometimes considered so, and is, therefore, to be alluded to here as an article of diet. Its flesh is very nourishing, and it is well calculated for many chronic diseases in which a very small quantity of food can only be taken. See article *Turtle*.

(*e*) The term *dry-fish* comprehends not only the really dry fish, but also pickled salmon and herrings, and salt-fish, known by that name, which are sold for use during Lent, and on the fast-days of the Catholic church. Salmon, haddock, herrings, and sprats are also sold dry, being salted and smoked, or *rubbed over with pyroligneous acid*, which answers the same purpose at less cost. Salmon dried and smoked is called *kippered*, for which purpose the spent fish or *kelts* are often, and I am afraid generally, used. Preserved herrings are either *red herrings* or *bloaters*, the former being very salt and highly dried and smoked, so as to keep for a long time, whilst the bloaters have very little salt or smoking, and are only calculated to keep a very short time, as a fortnight on the outside in warm weather. These fish are not adulterated, being really the article which they pretend to be, though the quality varies greatly, especially in the case of salmon. *Salt fish* consist of cod prepared chiefly in Newfoundland, some being dry, and others pickled by being placed in barrels with a liberal supply of salt. Both of these require soaking in water before use; but this is generally done by the fishmonger, who sends home the fish ready for dressing. In addition to these may be mentioned *sardines à l'huile*, which are small fish, somewhat like sprats, and preserved in oil. But none of these fish are at all fit for the invalid, and require the stomach to be in high order to bear their somewhat strong flavour. A very small quantity may be sometimes used as a relish, but beyond this it is not safe to go.

FISH, Poisoning by stale, symptoms of, 174; treatment of, 510.

FISTULA.—This term is sometimes used in surgery, synonymously with *sinus*, to signify a long narrow channel which has been left unhealed after the formation of an abscess, generally in consequence of improper management; but sometimes, in spite of the best treatment, when the constitutional powers are low, and adhesive inflammation, as well as the formation of healthy granulations, are in abeyance, or when there is a ligature existing, or a piece of dead bone, a long narrow sinus or fistula remains unhealed until these sources of irritation are got rid of. The *treatment* in such a case consists in first removing all such irritating causes, and then taking care that matter does not lodge; adhesion of the walls should be promoted, either by pressure or by stimulating injections, or what are called "tents"—that is, long thin pieces of lint, or similar material, introduced into the fistula. The indications, therefore, may be said to be three—viz., 1st, to remove the cause; 2nd, to arrange so that the matter comes away as fast as it is secreted, which will often require a fresh opening to be made; and, 3rd, to stimulate the interior of the fistula by injections of sulphate or chloride of zinc, or by the introduction of a tent. In some situations, something more than this must be done, in order to enable the two surfaces to be kept constantly in apposition. There are several kinds of *fistula* known as (*a*) *fistula in ano*; (*b*) *fistula in perinæo*; (*c*) *lachrymal fistula*; and (*d*) *salivary fistula*.

(*a*) *Fistula in ano* is one of these sinuses, which is situated by the side of the anus. It often gives intense pain, and, indeed, in some cases, to such an extent as to make life a burden. Sometimes there is a complete pipe or tube leading from the inside of the bowel, some inches above the anus to the outer surface, while in others the fistula runs up close to the interior, but without actually opening into it. In all such cases it is better at once to consult an efficient surgeon, who will do what is wanted; but failing such assistance, an attempt may be made to effect a cure by keeping open the external orifice by means of a small twisted piece of lint passed deeply into it, or a piece of common twine will do; and in addition taking great care to bathe the parts constantly, and to keep them scrupulously clean. It is, however, seldom that a cure can be effected by these means, because the constant action of the *sphincter*, or closing muscle of the anus, rubs the surfaces of the fistula together, and prevents there union. To remedy this, an operation is performed, by which the whole of the parts between the fistula and the bowel are divided by the knife, giving instant relief to all those spasmodic pains which are so constantly felt, and doing away with all doubt about the cure, which is readily effected afterwards. Those, therefore, who wish a speedy and sure termination of their sufferings, will allow of this trifling, though painful operation, being done, the moment it is advised by a competent surgeon.

(*b*) *Fistula in perinæo* occurs in the part called the *perinæum*, when an abscess has opened into the urethra, as well as on the surface, and as a consequence, the urine passes out of the external wound. There is almost always a stricture, and consequently the urine often passes more readily through the wound than by the natural passage. No one should attempt to cure such a dangerous disease except a competent surgeon, in whose hands it must be placed as soon as possible.

(*c*) *A lachrymal fistula* occurs at the inner corner of the eye, when an abscess of the *sac* (see *Anatomy of the Eye*) has burst outwardly. Generally speaking, the treatment consists in passing a *style* (a small silver instrument) down into the *nasal duct*, and keeping it there until the parts have entirely recovered from the inflammation which produced or accompanied the abscess.

(*d*) *Salivary fistula* is met with in the cheek, when an abscess has formed in or near to the duct of the parotid gland, where it brings the saliva from it to the mouth. It requires the nicest surgery to remove this disagreeable accident, and it is of no use attempting to enter upon the means to be adopted.

FITS.—See *Convulsions.*

FIXED AIR.—See *Carbonic Acid Gas.*

FLANNEL.—See *Clothing.*

FLATULENCE, or *Wind.*—By this term is meant an unnatural disengagement of gas within the stomach or bowels, or both, which may be caused by the decomposition of the food, or may be absolutely secreted from the lining membrane. There is always a most disagreeable sensation of fulness or distention, and sometimes this is to such an extent as to make the sufferer feel "ready to burst." There is generally an excessive amount of acid in the stomach, where flatulence prevails to any extent, so that in giving remedies, it is very usual to prescribe some alkali with them. These are usually called *carminatives*, and consist of spices, or warm tinctures, or essential oils obtained from some substance similar to spice. Those adapted for infants are given at 269 in adults, flatulence should be considered as a symptom and treate accordingly.

FLATULENCE occurs as a symptom of dyspepsia in its various forms, 153; hysteria, 148; diarrhœa and dysentery, 52, 53; colic, 91; remittent fevers of the adult, 28; and infantile remittent, 29.

FLEAS, Destruction of, 487.

FLESH is the muscular tissue of an animal, consisting chiefly of fibrine, together with the other elements of the blood.

FLESH-BRUSH.—A smooth but hard brush, intended to stimulate the surface of the skin, and remove the cuticle as fast as it is formed, so as to prevent the pores of the skin being clogged. The hair-glove is now generally used as a substitute for it. See *Hair-glove.*

FLOODING. — Profuse hemorrhage from the womb, 499 (*par.* 1509 *i.*).

FLOUR, or *Meal.*—The various kinds of flour used in ordinary house-keeping consist of *wheat-flour*, *Indian-meal*, *barley-meal*, *oat-meal*, and *pea-meal.*

(*a*) *Wheat-flour* is obtained in this country from two varieties of wheat, *spring-wheat* and *winter-wheat*, which, again, are either *red* or *white.* Foreign wheat belongs to several other kinds, some of which are of superior quality; while others are only fit to mix in small quantities with the best wheat, or to make flour of very inferior quality. Every kind of flour used in the formation of bread consists of two distinct classes of substance; one *nitrogenised*, consisting of gluten, vegetable fibrine, albumen, caseine, &c., so named after the various similar proteine compounds found in animal substances; the other, *non-nitrogenised*, consisting of starch, sugar, dextrine, or gum, &c., all products peculiar to the vegetable kingdom. Besides which, flour contains certain minerals, as silex, lime, &c. *The gluten* is the substance of the most importance in the composition of flour, inasmuch as it contains in its crude state most of the other nitrogenised substances, viz., fibrine, mucin, or caseine, and oil. It is separated by making the flour into a paste, kneading this well in a muslin bag, either under water, or under a stream running over it, and continuing this as long as the water is rendered milky. This washing dissolves the albumen, sugar, gum, and salts, leaving behind the *crude* gluten, consisting of—

Pure gluten	20·0
Vegetable fibrine	72·0
Caseine	4·3
Oil	3·7
	100·0

The greater part of the oil is contained in the bran or husk, but some of it remains with the gluten. In the trade the proportion of this valuable substance is guessed at by making a little of the flour into a paste, and judging of its tenacity by drawing it out into strings, and as this quality depends upon the gluten. the one is a measure of the other, These substances are used in making flesh or muscle, through the agency of the blood, into the composition of which they first of all enter; and they are found in wheat-flour in larger proportions than in any other description of flour. *The starch, sugar, and gum* are chiefly used in forming the fat of the body, and in carrying on the respiratory process, and hence their presence must not be overlooked, though not perhaps of equal importance with the gluten.

(*b*) *The meal from Indian corn*, or maize, is sold in the shops as *polenta*; and the coarsely-bruised grain as *hominy*. The former is capable of being made into nutritive and well-flavoured bread, either alone or mixed with other meals, whilst the latter serves, after long boiling, to make puddings, and for the feeding of poultry. Maize is now extensively used in many of our public charitable institutions, and is found to answer every purpose at a much lower price than wheat-flour. *Indian-meal, or polenta*, resembles wheat-flour more nearly than any other farinaceous article in its composition, containing, however, less gluten, but it has more oil, and therefore is more fattening, but less capable of supporting great muscular waste, as in working-men. In taste it is somewhat peculiar, being very sweet, and, to a person unaccustomed to its use, somewhat sickly.

(*c*) *Barley-meal* is composed of less azotised ingredients than either wheat-flour or Indian-meal; it is particularly deficient in crude gluten, and consequently it may nearly all be washed away, when a paste composed of it mixed with water is submitted to a current of the latter fluid. The starch, however, is very similar to wheat-starch; but in the action of boiling water upon the two flours there is a great difference, for after long boiling of barley-flour a portion remains undissolved, called *hordeine*; whilst wheat-flour treated in the same way is entirely taken up by the water, or at least practically so, the remnant being scarcely appreciable by our ordinary senses. As with wheat-flour, so with barley-meal, it is the produce of several varieties of the grain known as barley; but a vast proportion of that brought to market is the produce of the two-eared barley. The grains of these in their natural state, as *barley*, constitute the material for making malt, and also for feeding poultry, while the meal is used for fattening pigs and poultry, and for feeding dogs, &c. When denuded of the husk, it is called *Scotch barley*; and when the ends are still further rounded off, it becomes *pearl-barley*. When carefully ground and freed from husks, it is the *patent barley* of the shops; and when ground with less care, *barley-meal.*

(*d*) *Oatmeal* is produced from the oat of this country, of which several varieties are grown. The nature of the soil and climate, however, influences the quality more than the plant itself; and of all soils and climates none come up to those of Scotland for producing this meal in high perfection. Oats are sold as such for feeding horses, or, when intended for human food, they are deprived of their rough husks, and left in a state called *groats;* or, again, ground in various degrees of fineness, called *coarse oatmeal*, or *fine oatmeal.* The former stato is the more common in Scotland, and the latter in England. Oatmeal is highly prized as an article of food, and is said to be even better suited for the nourishment of laborious working-men than even wheat-flour. There is no doubt that for horses, and probably for dogs, it is much better adapted; but with regard to the human race it becomes a question only to be settled by a long trial on certain individuals who have had time to become accustomed to the use of each. In Scotland, oatmeal is the chief food of the labouring population, and they certainly are as able and willing to work as the English; but I much doubt whether the latter could be made to thrive to the same extent upon it as their northern brethren. *Oats* are composed of a larger proportion of proteine compounds than even wheat, and they are richer in oily matter than anything but Indian-corn. They are, however, deficient in starch and sugar, and consequently are not well adapted for making malt, though they *may* be used for that purpose.

(*e*) *Pea-meal*, obtained from grinding white peas, is used in cookery for pea-soup and peas-pudding. It is very full of nitrogenous compounds, and highly stimulating and nutritive, though somewhat given to produce indigestion, accompanied by flatulence and constipation. When mixed with wheat-flour in small quantities to form bread, it does no great harm; but its price is seldom low enough to make it worth while to adopt this mode of adulteration.

FLOUR MILK.—Receipt for making, 291.

FLOWERS OF SULPHUR.—Sulphur sublimed—that is, volatilized by heat and collected in a closed chamber. It is a drug much used in piles, and for some diseases of the skin.

FLUCTUATION.—When any fluid is contained within a cavity having yielding walls (such as those of the abdomen, or of an ordinary abscess of the cellular membrane), it may be made to communicate the sensation of "fluctuation" from one hand to the other, by pressing it with each in turn. If the walls are very thin, the sensation is very marked, and, indeed, the whole may be made to tremble· but when matter is seated deeply in the substance of the body or limbs, it is by no means so easy, and very considerable tact is required to distinguish the true fluctuation from a somewhat similar sensation which is communicated to the fingers by any soft and yielding, but still organised, body, such as loose fat in its cells. The power of thus detecting the nature of abscess, &c., is termed by learned surgeons "*tactus eruditus*," which is easily translated by "skilful use of the fingers."

FLUKES, 159.

FLUOR ALBUS.—Synonymous with *Leucorrhœa*, which see.

FŒTUS.—The embryo in its later stages is so named.

FOMENTATION.—This term is applied to the application of warm water, either simple or medicated, to the skin, by means of sponge or flannel. As far as possiblo the water should be in the form of vapour—that is to say, the flannel or sponge should be wrung out by the hands as dry as it can be made, and then at once applied to the part affected. The hands of washerwomen and nurses can bear the heat of water nearly at 200° F., and then a fomentation applied by their means, with water at that temperature, is a most efficient and grateful application in many diseased conditions, more especially in congestion and the early stages of inflammation, which a fomentation properly carried out will often dispel. In using water or medicated decoctions in this way, the best plan is to guard the bed and body linen with a blanket, which is better than waterproof material of any kind, as it absorbs the steam, while the latter condenses it. Then have two or three large pieces of coarse and thick flannel, or a couple of large sponges, and with a constant supply of boiling water, keep up as high a temperature in a basin of water as the hands of the person who wrings out the flannel or sponge can bear. Next wring out and apply the flannel, covering it with the blanket, and leaving it on for about three to five minutes; then proceed to wring out another and rapidly exchange the one for the other, repeating this at the same intervals for about half an hour, when the fomentation may be concluded for the present, and repeated if desired at a future period. After fomenting, the parts should be wrapped up in dry and warm flannel. Nothing answers better for the purpose than warm water, especially if of a soft kind; but decoctions of poppy-heads and marsh-mallows are supposed to possess greater virtues, and certainly they can do no harm if they do no good, which is a property not possessed by all popular remedies. Fomentations are often compared to poultices, but they more nearly resemble vapour-baths when properly carried out.

FOMITES.—See *Contagion.*

FONTANELLES.—At the junction of the two parietal with the frontal bone before, and with the occipital bone behind, two spaces are left in the new-born infant, where the bone is deficient. These are called the anterior and posterior *fontanelles*, and may readily be felt in the head by examining it with the fingers. The pulsations of the vessels of the brain caused by the action of the heart on its contained blood may be seen, and the fontanelles vary in fulness or concavity according as the child is strong and vigorous, or puny and inclined to waste.

FOOD, Use and effects of, 13 *et seq.*; mineral elements of, 15; quality and quantity for invalids, 17; articles of, suited to infants, 283, 285; articles of, suited to the nursery, 290; various kinds of, suited to invalids, 246 *et seq.*

FORCEPS.—An instrument in its principle of action similar to the common pincers of the carpenter. There are several varieties, as the common dressing-forceps, the tooth-forceps, artery-forceps, midwifery-forceps, &c.

FORE-ARM, Bones of.—These consist of two—namely, the radius on the outside, and the ulna on the inside. By a most simple adaptation of means to a particular end, the hand of man is enabled to mould itself to all surfaces through the power called "*pronation and supination.*" This is effected by articulating the fore-arm to the arm by means of the ulna, and to the hand by means of the radius, the two bones lying side by side, and attached above and below by circular straps or ligaments, which allow of their rotating, so that, without moving the elbow, the palm of the hand may be presented upwards or downwards with the greatest facility. This power is confined to man, and if the movements of the dog's or cat's fore-arm are compared with his, the facilities afforded by his superior formation will at once be recognized.

FORE-ARM, Treatment of fractures of the, 433.

FOX-GLOVE (see *Digitalis*), Treatment of poisoning by, 511.

FRACTURES of Bones, nature's method of repairing, 94; apparatus used by man to assist, 431—as splints, *ib.*; tapes and bandages, *ib.*; cold

lotions, 432; general principles of treatment, 432, 433; special directions for treating, 433 *et seq.*—as the metacarpal bones, 433; the bones of the fore-arm, 433, 434; the upper arm-bone, 434, 435; the shoulder blade, 435; the collar-bone, 436; the bones of the toes, *ib.*; the bones of the leg, 436, 437; the knee-cap or patella, 438; the thigh, 438, 439; the bones of the pelvis, 439; the spine, *ib.*; the ribs, 440; the lower jaw, *ib.*; the bones of the nose, *ib.*; the skull, *ib.*

FRECKLES, Treatment of, 390.

FRICTION, Utility of, as a substitute for exercise, 253.

FROST-BITES, Treatment of, 403.

FRONTAL SINUS.—A cavity in the bone behind the eye-brow, and communicating with the nose. When the mucous membrane of the nose is inflamed, as in *catarrh*, it often extends to the frontal sinus, and causes the heavy pain over the eyes which is then experienced.

FRUITS, whether fresh or dried, are extremely useful in affording to the blood the saline materials of which it is in need. It is in this way that lemon juice serves to prevent scurvy in sea voyages, which is now almost unknown among sailors in consequence of its general adoption. Fruits may be practically divided into—(*a*), *those which are grown in the open air in Great Britain*; (*b*), *hot-house fruits*; and (*c*), *imported fruits.*

(*a*) *To fruits grown in the open air* belong all the well-known tribe of currants, gooseberries, raspberries, cranberries, barberries, mulberries, strawberries, grapes, plums, cherries, apricots, nectarines, peaches, apples, pears, quinces, and medlars; walnuts, chestnuts, filberts, and hazel-nuts. The British wild fruits, consisting of the blackberry, whortleberry, and elderberry, are seldom to be met with in the shops. The large group of fruits which are now naturalized in this country, and which all have the distinctive name of berries, are exceedingly wholesome in moderate quantities, and when used as alteratives rather than as regular articles of diet. In the grape, gooseberry, currant, elderberry, whortleberry, and cranberry, the seed is contained within a pouch, or skin, suspended in a mucilaginous fluid, and this skin being thick is always very indigestible, and should not be swallowed when it is of sufficient size to be excluded, as in the case of the grape and gooseberry. On the other hand, strawberries, raspberries, and mulberries have a fleshy interior, with a mammillated exterior, on which the seeds are placed. They all contain a mixture of vegetable acids, with more or less saccharine matter and mucilage, and they are useful as affording a slightly laxative and cooling food, which removes the ill effects consequent upon a too liberal use of nitrogenized compounds, as is too often practised in this country, where butcher's meat and wheaten bread form the staple of our ordinary diet. The gooseberry is eaten in puddings and tarts in an unripe state, in which there is no development of sugar; but the acid contained in it is very wholesome, and there can be no doubt that it is a very desirable article of food when properly mixed or alternated with other materials. When eaten raw, the proportion of acid is too great for the stomach, and the consequence is that spasms, with other forms of disturbance of the digestive organs, make their appearance. In all cases green gooseberries ought to be boiled or baked, and mixed largely with sugar. Almost all the above-mentioned fruits are supplied to the fruiterers by the market-gardeners and others throughout England. Apples and pears are chiefly grown in the western apple-district, comprising Devonshire and the western parts of Somersetshire and Dorsetshire, and in the midland apple-growing district, including Herefordshire, Worcestershire, and a small section of Shropshire. In these two extensive tracts, orchards are to be seen in all directions, and the growth of apples in a good season, or a "hit" as it is called, is of incalculable advantage to all classes, from the poor cottager, who has only a few trees, to the owner of acres of land bearing this kind of fruit. Pears are chiefly grown in the midland district, especially those producing perry. Apples, pears, quinces, and medlars are the most wholesome fruits we have; the two first being generally cultivated, and brought to market in large quantities. They are met with in great variety, some of each sort being intended solely for the table, others for cyder and perry, and a third kind for boiling, baking, and stewing. Quinces are only used for improving the flavour of apples in tarts and for making marmalade, as in their raw state they are not admired. The stone-fruits are almost all of them unwholesome when eaten in any quantity, arising from the firmness of the substance of which they are composed. Plums are notoriously prone to produce diarrhœa, though there can be no doubt that this complaint is particularly prevalent at the plum-season, and therefore the concurrence of the two may be accidental, and the one not caused by the other. Peaches are wholesome enough, partly because they are seldom eaten in sufficient quantities to cause disturbance of the digestive organs. With regard to nectarines, they hold an intermediate place in point of wholesomeness; and apricots, when ripe, may perhaps be classed with them. In their green state, they are made into tarts, and are tolerably digestible, but are not so much so as gooseberries or rhubarb. Cherries are certainly quite as indigestible as plums, and being chiefly eaten in their raw state, and often when quite unripe, they are on that account doubly dangerous. Nuts of all kinds are much relished by all classes, but they require the stomach of an ostrich or a pig to digest them, and should never be eaten in large quantities. I certainly have known a peck of filberts eaten with impunity at a sitting, but this is an exceptional case, and no one should presume to imitate such a bad example. Chestnuts, when roasted, become flowery, and are then perhaps wholesome enough; but all raw nuts are solid and full of oil, so as to defy the delicate stomach to soften and digest them.

(*b*) *Hot-house fruits include British pine-apples*, *grapes*, and *melons*; the two last being also grown in the open air. Grapes are remarkably wholesome, and are extensively used for invalids. Melons and pine-apples are quite the reverse, being less suited to a weak stomach than almost any other fruit; but from their cost in rearing they are placed beyond the reach of all but the luxurious, and therefore they need not be further alluded to here.

(*c*) *Foreign Fruits.*—The trade in this department is now a most extensive one, particularly in pine-apples, oranges, and lemons, which are imported into this country in enormous quantities. In the early stage of the West Indian trade, fifteen years ago, pine-apples were imported without flavour or juice, and were scarcely better than turnips; but they are now almost equal to the produce of our hot-houses, and are a great luxury to those who are fond of the flavour, being even within the reach of the lower classes at a penny a slice, which is often the price in the streets. More than 200,000 are said to be imported per annum, and most of these are sold by retail at 1s. or 1s. 6d. a-piece. This is effected by the aid of clippers, which, as in the case of oranges, bring the fruit from shore to shore in one quarter the time which was formerly taken, the passage up the channel being hastened when necessary by steam-tugs sent out for that purpose. Incalculable quantities of oranges are thus brought from Spain, Portugal, the Azores, Madeira, and Malta; and though the number has been fixed at more than 300 millions, yet this is in a great measure guesswork, as there is only a duty on them per bushel. For this trade alone, more than 200 vessels are constantly employed, bringing oranges, lemons, limes, citrons, and nuts during the winter and spring, and afterwards plums, cherries, grapes, apples, pears, chestnuts, &c., until the oranges come in again. In London, the trade is monopolised by a limited number of wholesale fruit-merchants in the neighbourhood of Thames Street, Botolph Lane, and Pudding Lane, where large warehouses receive the consignments, only to hand them over as rapidly as possible to the lesser dealers in this commodity. The choice kinds come to Southampton, and thus avoid the tedious navigation of the Thames—the transit by railway only occupying a single night; but the great bulk of the fruit is brought into the river, and at once transferred to the above-mentioned localities. Liverpool is also now a great centre of the foreign fruit-trade, supplying itself, and also the adjacent manufacturing districts, where very little fruit is grown, in consequence of the destructive nature of the smoke from the factories. The wholesomeness of oranges and grapes is too well known to need dilating upon, and the opposite nature of pine-apples has been already alluded to. Lemons are only used for medicinal purposes, and for flavouring drinks of various kinds; but for this purpose they are exceedingly valuable. The foreign plums, apples, pears, &c., do not differ in this respect from their native representatives.

FRUMENTY, Preparation of, 291.

FUMIGATION (see *Disinfectants*).—The term is also applied to a mode of applying vapours to the throat or other limited space. The material to be applied is thrown upon a hot iron in a closed chamber, resembling a coffee-pot, and then a spout which leads from it is conducted to the part, and the vapour which arises is thus brought in contact with it.

FUNCTION.—The office or duty of an organ.

FUNCTIONAL DISORDER.—This term is applied to the condition of an organ when its natural duty is suspended without absolute alteration of *structure* (*par.* 3).

FUNGI, Edible.—See *Vegetables.*

FUNGUS.—A diseased growth, which may be either simple or malignant.

(*a*) *Simple fungus* is merely an extravagant formation of granulations, and when it occurs in wounds is called "proud flesh." See *Fungous Ulcers*, 394.

(*b*) *Malignant fungus* is described as *medullary sarcoma*, 161.

FUNIS UMBILICALIS.—The *navel string* which supplies the child before its birth with blood from its mother's circulation, and returns it again to her after it has passed through its various duties. It is made up of arteries and veins slightly twisted upon each other to allow of some degree of extension without breaking, and enclosed in a thin skin. About four or five days after birth, the short portion of the cord left on sloughs, leaving a small ulcer which soon heals.

FUR.—The skin of an animal with the hair on. It is used as a warm article of clothing, on account of its being a bad conductor of heat, which is chiefly from the large quantity of air included among the several hairs of which the fur is composed. When wet, it is not by any means so warm as wool, or sheep-skin covered with its natural wool, which being more greasy and firm, does not collapse like fur and become one solid mass of wet.

FURUNCLE.—See *Boil.*

GALBANUM.—The concrete, gummy, resinous exudation from *opoidea galbanifera.* It occurs both in tears and lump, of a pale greenish-yellow colour, with a strong and peculiar odour, and an acrid taste It is employed as an antispasmodic, either in pill or as an emulsion—the dose being ten grains.

GALBANUM, Pill of, 240.

GALL.—The bile, 96.

GALL-BLADDER, 95.

GALL-DUCTS, Anatomy of, 95; congestion in the, 101; jaundice from obstruction in the, *ib.*

GALL-STONES, Nature of, 101; symptoms of, *ib.*; treatment of, 444, 445.

GALL and SPURTZEIM.—The inventors of phrenology, 217.

GALLIC ACID, 223; ointment of, 475.

GALLS, 234; ointment of, 239.

GALVANISM.—The subject of galvanism and electricity is a very wide one, if examined in all its bearings; but our only object here is to consider how far either of them may be made subservient to the cure of disease. By actual experiment, it may be shown that the secretions go on more rapidly when a slight galvanic current is passed through the particular gland; and in the same way, the muscles may be made to contract, and the nerves to do their duty more efficiently than before. Whether the improvement continues or not after the galvanic stimulus is withdrawn, is a question which admits of dispute, and upon which must depend the efficacy of galvanism in a medical point of view. The first purpose to which galvanism was applied in medicine, was the breaking up of stone in the bladder, for which it was supposed by Messrs. Prevost and Dumas that it was peculiarly applicable; but the plan only applies to some one or two of the different kinds, and it is very difficult to manipulate, besides which the modern system of lithotrity is so simple, that it has completely superseded all idea of this operation. It has also been applied to the restoration of persons found drowned, or otherwise suffocated—and a very powerful agent it is, and when at hand, should never be neglected under such circumstances. But it is in paralysis that galvanism is chiefly applicable; and here it will really be found of the greatest service. Care should always be taken that the original cause of the loss of power is removed, and then the regular application of galvanism may be relied on as the most efficient means we possess of removing the effects of the disease. Galvanism may be applied as a continued current, or it may be given in the form of shocks, the latter method being the more stimulating to the nerves, and particularly applicable to old standing paralysis, while the current will be more likely to be of service in slight cases and in partial paralysis. But in all cases, the feelings of the patient must be consulted as to the strength of the shock or current, as there is a vast difference in the power of bearing the galvanic fluid, of whatever nature it may partake. The following rules are to be enforced as embodying the best means of employing galvanism:—

(*a*) Always use low powers before proceeding to employ high ones, and gradually augment them until some effect is produced, when that degree may be steadily maintained for some time.

(*b*) Perseverance in the use of galvanism is a main feature in its agency, as its effects are scarcely perceptible from day to day.

(*c*) Galvanism should not be relied on as a sole means of cure, but as an addition to others, with which it has the advantage of never interfering.

(*d*) Where the continuous current is employed, the plates should have as extended a surface as possible, as the curative power appears to depend more upon the *quantity* than the intensity of the galvanic fluid.

GALVANIC TROUGH.—When two solid conducting bodies are plunged into a liquid which acts upon them with unequal violence, the electric equilibrium is disturbed, one of them acquiring the positive condition, and the other the negative. Thus pieces of zinc and platinum, separated by a non-conductor, and put into diluted sulphuric acid, constitute an arrangement capable of generating electrical force—the zinc being the metal attacked becomes negative, while the platinum resisting the acid becomes positively electrical; and, on making a metallic communication between the plates, a discharge ensues, which is repeated again and again, as long as the metals and acid remain in contact. Several of these plates of metal constitute a galvanic battery, which may be made of almost any power by increasing their surfaces, and adding to the amount of acid. For medical purposes various machines are employed, but that which is in most general use provides for a succession of very slight shocks, the points of contact being broken and renewed very rapidly by a simple mechanical principle.

GAMBOGE, 234.

GAME, High, often a poison, 174; treatment of, 510.

GANGLION, in anatomy, signifies a small collection of nervous matter, 112.

GANGLION, in surgery, is an enlargement of the sheath of a tendon, by means of a glairy fluid resembling white of egg, and contained in a small bag or sac. It is very common about the wrists, and presents a small rounded tumour, either on the back of the wrist, or sometimes on the inside, moving with the tendons as the muscles contract, and feeling hard and regular in its outline. The treatment to be adopted consists in emptying it of its contents, either by a blow which is a very painful proceeding, or by making a small opening into it with a very fine knife, taking care not to admit air, and afterwards keeping up considerable pressure with a bandage for some weeks. In this way I have succeeded in curing many, without any pain, and certainly in a most safe and efficient manner. The knife ought to be of the kind used for what are called subcutaneous incisions; but its employment requires rather more skill than is often possessed by any one but the regular surgeon.

GANGRENE, Mortification or sloughing, nature of, 76; treatment of, 406.

GAPING.—See *Yawning.*

GARGLE.—A liquid remedy for inflammation or relaxation (that is, passive congestion) of the throat. It is used by pouring a little into the back of the mouth, and then throwing the head well backward, the air is expelled through it, causing it to bubble or "gargle" in a peculiar manner. Several domestic applications of this kind are in common use; but the nitrate of silver, in solution, applied with a brush is a far better remedy, and is now generally employed instead. The following may be used to clean ulcerated throats, or for ordinary relaxation.

(*a*) Take of sage tea, half a pint; vinegar, one ounce. Mix. (*Useful in slight relaxations.*)

(*b*) Take of solution of chlorinated soda, half an ounce; water, seven ounces. Mix. (*Useful in ulcerated sore-throats, or in that state which comes on after salivation.*)

(*c*) Take of diluted hydrochloric acid, two drachms; honey, half an ounce; infusion of roses, seven ounces. Mix. (*Useful in relaxed sore-throat.*)

(*d*) Take of tincture of capsicum, two drachms; diluted sulphuric acid, two drachms; infusion of roses, seven ounces and a half. Mix. (*Useful in relaxed sore-throat.*)

(*e*) Take of tincture of catechu, half an ounce; infusion of roses, seven ounces and a half. Mix. (*Useful in slight relaxations, where the tone of the voice is affected.*)

GASTRIC JUICE.—A secretion from the lining of the stomach, which aids in the solution and digestion of the food. See *Digestion*, 153.

GASTRIC FEVER, Symptoms of, 28; treatment of, 357.

GASTRITIS (*inflammation of the stomach*), symptoms of, 52; treatment of, 376; treatment of, in children, 305.

GASTRO-ENTERITIS, Nature of, 81; treatment of, in children, 305; in the adult, 412.

GELATINE.—Certain animal substances, such as skin, tendons, and bones dissolved in water at a boiling temperature, give solutions, which on cooling assume a tremulous, semi-solid consistence, which is commonly known by the name of "jelly." The substance so produced is called *gelatine*, which does not exist in the same state beforehand, but is produced by the action of boiling water on the membranous tissue. Calves' foot jelly and common glue are the two most familiar examples of gelatine; and the substance sold in the shops as "gelatine," as well as isinglass, both come under the designation of *gelatine* in the sense in which it is employed by the chemist. When dried it is composed as follows:—

Carbon . . .	50·05
Hydrogen . . .	6·47
Nitrogen . . .	18·35
Oxygen . . .	25·13
	100·00

The two substances known commercially as gelatine and isinglass, as above remarked, are both composed of the same chemical materials; but they differ considerably in their external appearance, and in their internal qualities, especially when applied to the purposes of *invalid* cookery. It will, therefore, be well to examine them together.

(*a*) *Gelatine* is extracted from the bones and hoofs of the ox and sheep, as well as in some cases the horse, by boiling them in water at a high temperature obtained by pressure. Refuse skins, leather-cuttings, and cod-sounds are also used for the same purpose; in fact, anything containing gelatine, which at any particular time can be purchased at a low rate. These make a jelly more or less pure, which is strained and bleached, and then dried in thin *laminæ*, and cut into shreds by a machine. These shreds, however, are not quite so fine as those of isinglass, inasmuch as the gelatine having no cellular membrane to hold it together, and its molecules also being of a coarser size, will not cohere sufficiently to allow of the same degree of subdivision as isinglass.

(*b*) *Isinglass* is procured from various parts of different fish; but the true kind is made from the swimming-bladder of the sturgeon. Spurious isinglass is obtained from the intestines of the cod, and called ribbon isinglass. It consists of gelatine more or less pure according to the quality. It is imported from Russia, Brazil, and the East and West Indies. The first of these is far the best in quality, whilst that from Brazil is very impure, and fit only for the brewer or refiner. Isinglass is imported in the forms known as *best, seconds*, and *thirds, leaf-isinglass, purse isinglass, long and short staple isinglass*, which all require solution and clearing, as well as further preparation for the market, when intended for culinary purposes. The leaf-isinglass is chiefly obtained from the beluga (*accipenser huso*), and is that from which the best isinglass is prepared. Each leaf is generally about ten or twelve ounces in weight, and is submitted to the action of rollers worked by steam, which spread it out into a thin ribbon, and it is then cut by a rapidly-revolving cutting machine into the fine shreds, in which state it is sold. When dry it is semi-transparent, but on contact with water it soon becomes opaque, and swells, and dissolves slowly in it, leaving a very slight residuum of cellular membrane, so thin as not to be perceptible without a very careful examination. Russian isinglass makes a transparent jelly when cold, but that from Brazilian isinglass is somewhat milky.

(*c*) *To distinguish the one from the other*, Dr. Hassall gives the following directions:—"*The shreds of isinglass* when immersed in cold water become white, opaque, soft, and swollen. The swelling is equal in all directions, so that when viewed with a low power of the microscope (an ordinary lens), they appear more or less quadrangular. In boiling water they dissolve nearly without residue. The smell of the dissolved isinglass, when hot, is somewhat fishy, but not unpleasant. The moistened shreds, or the solution, exhibit to test-paper a neutral or faintly alkaline, and rarely a slightly acid, re-action. In acetic acid they swell up, and become soft and jelly-like, the greater part of the structure being lost. Lastly, according to Dr. Letheby, 'the ash which results from the incineration of good Russian isinglass is of a deep red colour; it contains but a small portion of carbonate of lime, and never amounts to more than nine per cent. of the isinglass used.' *The shreds of gelatine*, on the contrary, when placed in cold water, swell up, acquire increased transparency, and become translucent and glass-like. The form which they take in swelling is peculiar; they do not, like those of isinglass, swell equally and remain quadrilateral, but become expanded, flat, and ribbon-like, the broad surfaces corresponding to the incised margins. The dry threads on the uncut surfaces frequently present a peculiar shining lustre, not unlike that of tinsel. In boiling water the shreds do not entirely dissolve, but in most cases a copious deposit falls to the bottom of the glass. The smell of the hot infusion is like that of glue, and therefore disagreeable. The moistened filaments, or the solution of gelatine, usually exhibit a strong acid reaction; this, in some cases, is due to the substances used in bleaching it. Immersion in diluted acetic acid hardens gelatine. Lastly, according to Dr. Letheby, the ash is different from that of isinglass in amount, colour, and composition; 100 grains of gelatine give from 2·3 to 2·6 grains of ash, which is *white*, and contains much carbonate of lime with some chlorides and sulphates."

(*d*) *Gelatine* as now manufactured, especially the superior samples, is quite as good as isinglass for *invalid* purposes, though inferior to it for making some of the finer descriptions of jellies, blanc-mange, &c. Its comparatively low price, however, induces many people to adopt its use for all purposes for which isinglass is ordered in the cooking receipts.

GELATINE, as a food for infants, 284.

GENTIAN-ROOT.—Physical properties and use, 234; extract of, 233; infusion of, 235; tincture of 245.

GESTATION, Utero.—See *Pregnancy*.

GIDDINESS (*Vertigo*).—This is a morbid sensation with which all must be familiar, wherein the power of balancing the body is wholly or partially lost, and surrounding objects appear to swim round. It occurs in the commencement of fainting, and is a symptom of congestion of the brain, epilepsy, bilious disorders, fevers of all kinds, and such cases of debility as cause an approach to fainting from defective action of the heart.

GIN, which is the spirit chiefly used in London, is produced in great measure from barley alone, with the substitution of wheat, oats, rye, or Indian-meal, when the price of any one is below that of barley, taking into consideration the relative power of each in producing spirit. The corn is ground, and it is then mashed in the usual way, and distilled two or three times over; but the rectifier must be a distinct person from the distiller, according to the exciso laws. The distillers are generally very large manufacturers; but tho rectifiers often conduct their business on a limited scale, buying the proof spirit of malt, and making it up in the course of its rectification so as to convert it into gin, London gin, cordial gin, or any other similar compound, the flavouring material being juniper berries, or sometimes turpentine, or a mixture of both. From the nature of these articles, gin acts considerably on the kidneys, and may be classed as a mild *diuretic*. When tolerably pure it is not unwholesome to those whose kidneys are at all sluggish; but to those in whom they act more than is to be desired, it is highly prejudicial. See also *Fermented Liquors*.

GINGER is cultivated in Asia, Africa, and the tropical parts of America, and is the root of *Zingiber officinale*, a perennial plant, of which the stem reaches to the height of three or four feet. The roots are dug up at the end of the first year; they are well washed, and then they are stripped of their outer skin, or left as they are, constituting in this way the two primary divisions of ginger

into *coated* and *uncoated;* in addition to which, it is sometimes imported from Jamaica in a *green* state, preserved in jars with syrup. The two first divisions are sold either in the state in which they are imported, or finely ground, and sifted with great care. Ginger owes its pungency to a volatile oil with an acrid resin which are contained in it, and mixed up with other vegetable substances, as gum, starch, and woody fibre. Ground ginger contains all the elementary principles of the root, but is much adulterated with flour.

GINGER, Tincture of, 245.

GINGER BEER, Receipt for making, 250.

GLANDS, Structure of the, 95; varieties of the, *ib.*; congestion and inflammation of the, 99 *et seq.*—as, of the liver, 99; the biliary ducts, 101; spleen and pancreas, 102; kidneys, 102 *et seq.*, salivary glands and tonsils, 107; thyroid body, 109; absorbent glands, 110.

GLANDS, Treatment of inflamed and congested, in children, 316 *et seq.*—as congestion of the liver, 316; of the kidneys, 317; mumps, 318.

GLANDS, Treatment of inflamed and congested, in the adult, 441 *et seq.*—as active congestion of the liver, 441; passive congestion, *ib.*; acute hepatitis, 442; chronic hepatitis, 443; jaundice, 444; congestion and inflammation of the spleen and pancreas, 445; simple inflammation of the kidneys, *ib.*; Bright's disease, 447; gravel, *ib.*; bloody urine, 449; suppression and retention of urine, 450; incontinence of urine, 451; diabetes, *ib.*; inflammation of the parotid gland, 452; inflamed tonsils, 453; bronchocele, 454; inflamed testicle, 455; inflamed absorbent glands, 456, 457.

GLAUBER'S SALTS.—Sulphate of soda, 243.

GLAUCOMA, Symptoms of, 163; treatment of, 490.

GLOBUS HYSTERICUS. — Hysterical ball in the throat, 149.

LOTTIS.—The opening in the larynx through which air passes down into the trachea. See *Larynx.*

GLUTEN.—The most important principle in flour. See article *Flour.*

GLYCERINE.—In the modern process of forming candles from fatty matters, a very peculiar substance is removed called *glycerine.* It is also readily obtained by heating together olive-oil, protoxide of lead, and water, by which an insoluble soap is formed known as *lead-plaster*, while the glycerine remains dissolved in the water. When pure it is a colourless and very viscid liquid, sweet in taste, and readily mixing with water. Exposed to heat, it volatilizes in part, a portion also of the remainder becoming converted into a substance possessing a most disagreeable odour, which is called *acrolein*, and is smelt after blowing out a tallow candle. Glycerine does not readily evaporate at the ordinary temperature of the air, and forms a mild and soothing artificial coating to the skin in many of its diseases. See *Treatment of Skin Diseases*, 381 *et seq.*

GODFREY'S CORDIAL.—A popular remedy for children's diseases, which contains opium, and is therefore calculated to do harm in many cases. It is generally compounded of sassafras, coriander and caraway seeds, aniseed, treacle, and tincture of opium. The proportion of laudanum is usually about twenty drops to one ounce of the cordial, but this varies greatly among different makers.

GOITRE, or *bronchocele*, symptoms of, 109; treatment of, 454.

GOOSEBERRY.—See *Fruits.*

GOULARD EXTRACT.—Liquor of acetate of lead, 237.

GOULARD WATER.—See *Liquor of Acetate of Lead*, 237.

GOUT, Nature and symptoms of, 87; symptoms of its paroxysms, 88; of atonic low, *ib.*; treatment of, 413, 414.

GOUTY DIATHESIS, Symptoms of, 87; treatment of, for its removal, 414.

GRAIN.—See *Flour.*

GRANULATIONS, Nature of, 43; necessary as a means of uniting certain wounds, 397.

GRAPES.—See *Fruits.*

GRATES AND STOVES, or the well-known mechanical contrivances for heating our apartments, are of various kinds, more or less calculated to answer the purposes for which they are intended, and especially varying in their capabilities with reference to the invalid. They include (*a*) open grates, (*b*) open stoves, (*c*) closed stoves, (*d*) apparatus for conveying heated air from the back of the grate, or from another room, (*e*) hot water-pipes, (*f*) gas stoves, and (*g*) gas open fire-places.

(*a*) *By open grates* we understand any kind of open fire-place which is contained within and behind the surface of a wall, in contradistinction to stoves of all kinds which project more or less from its face. It is a subject of frequent remark, that people complain of cold in an apartment maintained at a temperature of sixty degrees by the introduction of warmed air, while no fault is found if the room has an open fire, although the temperature may be four or five degrees lower. The principal objections to the open fire-place as ordinarily constructed are, the large expenditure of fuel in proportion to the effect produced, and the difficulty of warming an apartment equally and effectually. According to Dr. Franklin, not more than a fiftieth part of the heat generated was rendered available for warming apartments when he resided in England (1725); somewhat later (1798) the loss was estimated by Count Rumford at fourteen-fifteenths; and recently by Dr. Arnott at seven-eighths of the whole quantity consumed. The heat which escapes in the smoke is computed at more than one-half; the loss by the warmed air of the room constantly entering the chimney above the fire is said to be two-eighths, and one-eighth of the fuel is supposed to pass away unburnt in the smoke. In reference to the unequal heating at different distances from the fire, it is observed that the effect of radiant heat is inversely as the squares of the distances; so that the walls of an apartment are scarcely heated, and therefore reflect no heat on persons in the room, who, if they sit at a distance from the fire, are too cold, and if near it, are too warm. More serious causes of objection are the cold draughts created by the air rushing in through the crevices of the doors and windows, and playing upon the backs of persons sitting round the fire; or forming a cold bath several inches in depth on the floor, in which their feet are constantly immersed. Another objection, but hardly a just one, is bad ventilation. That the usual mode of ventilating a room by the air escaping from it up the chimney is not the most perfect, may be admitted; but it is at least a tolerably efficient method, and infinitely superior to that afforded by the thermometer stove, or any of the varieties of Russian, German, American, and Swedish stoves—being objectionable rather on account of certain contingent disadvantages than of its inefficiency. Various forms are adopted for this purpose, and fashion is constantly changing them, as far as the detail of parts is concerned; but in principle little or no improvement has been made of late years, if we except Arnott's smokeless grates. Every one has of course a fire-place to refer to, and therefore any illustration is here unnecessary of the ordinary form; but it must be described as consisting of a rectangular chamber hollowed out in the wall, averaging three feet in width and height, and fourteen inches from front to back. Such is the chamber without the grate; it is bounded below by the hearth-stone, which should be securely set in brick-work turned in the form of an arch from the wall to the trimmer, and above by the flue, which should not commence with too abrupt a shoulder; this is well provided for by Moore's patent contractor. The flue is usually fourteen inches by nine, if built of ordinary bricks; but they are now made on purpose to form parts of a circle twelve inches in diameter, and will bond in with the brick-work exceedingly well. The interior, if built in the usual way with common bricks, requires to be plastered with mortar mixed with a certain quantity of cow-dung, called *pargeting*, hair being unfit for the purpose, and the cow-dung containing saline matter sufficient to prevent the soot from closely adhering to it. In carrying up the flue, all severe angles are to be avoided; but it is always desirable to avoid a perfectly straight tube, which, in the first place, allows the rain to fall straight upon the fire; and, in the second, permits also the wind to pass downwards without obstruction. The remedy for both is to "gather over" the chimney, immediately above the highest ceiling, from one side to the other, to such an extent that the one side is exactly perpendicular to the other, and thus prevent both the uninterrupted fall of rain and the descent of the wind. We will suppose a gust of wind blows down the chimney; if this is straight, there is nothing to stop its course; but *if soon after its entry*, it strikes against a surface at an angle, it is turned to the opposite side, which also it strikes at a similar angle, and thus loses its power before it reaches the bottom. Among the first who directed attention to the improvements of the domestic hearth, Count Rumford is the best known in this country. The alteration which he made was very simple, but its success had the effect of remodelling all the arrangements of the fire-place; and it has been the parent of the numerous register-stoves now seen, which have swept away the goodly chimney corners and wide open fire-places of our ancestors. This change was effected by contracting the throat of the flue. Within the large cavity of the chimney-opening, he formed, as it were, a second fire-place, by building a wall in front of the chimney-back, and so much in advance of it, that when carried up to the level of the arch at the back of the mantel, a space of not more than four inches was left for the depth of the throat from the back of the arch to the face of the new wall. He then contracted the opening over the fire by placing upright covings of brick in each interior angle of the recess. These formed an angle of about 135 degrees with the back of the fire; the distance between the re-entering angles of the covings being in no case greater than the width of the perpendicular part of the flue. By this arrangement, the area of the throat of the chimney was reduced to 72 inches, and in many cases made even a third less. To facilitate the sweeping of the flue, the upper part of the back wall was formed with a slab of stone or fire tiles, which could be pushed back to allow a boy to pass into the flue, and afterwards replaced. The immediate results of these alterations were, the entire prevention of smoky chimneys, increased heat thrown into the apartment, and a degree of general comfort previously unattainable. Soon after Count Rumford's fire-places had become known, register stoves, having somewhat the same appearance, were introduced. Their elegant design, in iron and polished steel, and Rumford-like form, did not obviate the bad effect of substituting metal for the non-conducting material, fire-brick. In these stoves the metal back of the grate would soon be destroyed if the heat were not rapidly carried off by the air on the other side, in the cavity purposely left behind the stove which communicates with the chimney. The very circumstance, however, of the iron back being preserved by constantly parting with the heat received from the fire to the air behind it, prevents the fuel in its vicinity acquiring the temperature necessary for perfect combustion. In a grate with iron sides and back, the fuel in contact with the iron is always seen black on the edges, and the fire cannot be made to burn vividly, or without forming smoke.

But when the grate is lined with fire-brick (which is a bad conductor) of considerable thickness, the brick retains the heat imparted to it by the incandescent fuel, upon which it re-acts until the fuel and fire-brick are heated up to a clear bright fire free from smoke, and presenting a mass of radiant incandescence, having three times the power of a grate holding the same quantity of fuel, but lined with iron. Very little heat can be obtained by radiation from a small fire in an iron grate; but a very small grate lined with fire-brick will give out a large quantity of heat, and less of the fuel escapes up the chimney. Count Rumford made the flue opening into the chimney as nearly as possible perpendicular over the burning fuel. The discovery that this is not an essential condition has of late years led to the introduction of an entirely new class of stoves, in which the fire-place is closed completely over at the top, and the smoke passes into the chimney through a luffered opening at the back. Both the last-mentioned stoves throw out an amount of heat which few register stoves with fire-places of the same size are capable of emitting. *The register grate*, as at present constructed, consists of a frame-work of iron fitting into the space left in the brick-work, and containing an open basket of iron bars, in which the fire is made. It is usual to make this frame-work in two portions, one being a square fitting into the mantel-piece, the other projecting back from this on each side, as well as at the top, at an angle of 45 degrees, and containing within it the grate itself. This last may either consist simply of bars, which line it at the bottom and front, or it may also be backed with a fire-brick tile, which prevents the heat being dissipated by the rapidly conducting power of the iron. At the top the bevelled boundary is pierced by an oblong square aperture, to allow of the escape of the smoke, and set in this is a trap-door, which may be lowered entirely when a fire is not wanted, as in the summer months, by which precaution the fall of soot is guarded against. Register grates are now set very low, with the intention of avoiding as much as possible the loss of heat up the chimney, which in the old mode of setting high was a great fault. Perhaps the present fashion may be carried to excess, and when high fenders are used with them it certainly is an objection; but with the modern low fender no heat whatever is suffered to be lost by radiation. Dr. Arnott is of opinion that no grate should be set lower than fourteen inches from the hearth; but this is, I think, carrying out the opposite opinion too far; and I should myself prefer eight or ten inches as the best height for giving out heat. Sometimes the space beneath the grate is filled up with fire-bricks, which by their radiation serve to throw out a great deal of heat; and I am told that a grate so altered has increased its heat-producing power very considerably. A great variety of forms is sold, but all come under the above description, with additions, however, intended solely to obviate certain inconveniences. Those most in request are known as Sylvester's, Stephen's, Jobson's, and Wright's. A very good form of low grate is one in which the fuel is actually laid upon the hearth, which is made of iron and perforated. Beneath this is a chamber, to which air is admitted either from the room or from the external air. In the former case this is effected by means of steel tubes, ranged side by side, and giving the effect of a fender; whilst in the latter an ordinary tube of metal or earthenware is laid to the outer wall. Either of these is well adapted for burning wood, without the addition of the props which kept it from the hearth in the old fire-places, and which are called *dogs*. *The points* to be attended to in register grates are the following:—1st, to set them *moderately* low; 2nd, to line the grate with *fire-bricks*, not with iron; 3rd, to make the upper area of the grate considerably wider than the lower; 4th, to carry off the smoke with as small an opening as will suffice, and if possible, directed backwards rather than forwards. *Dr. Arnott's smokeless grate* is in the form of a register grate, with a magazine below, in which a certain portion of coal is deposited before lighting the fire. This magazine is raised by means of a poker passed into an aperture made for the purpose. This grate effects the following objects, which are no doubt great advantages:—1st, there is entire absence of smoke; 2nd, from the carbon being *all* united with oxygen, a great saving of fuel is effected; 3rd, it will burn for twelve hours by merely applying the poker; 4th, it is never obscured by the recent throwing on of fresh coals. But, like every good in this world, it is not unmixed with evil, for we miss in it the cheerful blaze so dear to the heart of every Englishman. It is in fact a clever imitation of the old plan, now commonly revived, of lighting the fire at the top, placing in addition a piece of paper at the bottom to cut off the draught of air, In this way an ordinary fire, if lighted from above, will burn for eight hours; but then it must be let out before it can be relaid, whilst in Dr. Arnott's grate the reservoir can always be refilled, and the fire may be kept in for any length of time. There is no doubt of the economy of this stove, and its only objectionable feature is the absence of cheerful blaze. *The sham register* is a very cheap and economical stove, both in original cost and in the saving of heat. It consists merely of a front and bottom of iron bars, which are set in brick-work, bevelled to the form of a register stove. The place for the fire is formed by building up the sides and back with fire-brick, and giving to each coving an angle of about 135 degrees with the back. The bottom grate is from five to seven inches deep from front to back, according as the front bars are straight or curved; and the brick-work at the back slopes upwards for about twelve inches from the bottom grate, and is thence carried up with the covings as high as the centre of the arch over the chimney opening. At this level the throat of the flue is contracted by fire-tiles, stone, or an iron plate, to a breadth from front to back of about four inches. The sweeping machine generally renders the moveable slab unnecessary. If, however, free access to the flue above the throat is required, the contraction can be made with an iron plate hinged to the back of the front, like the top flap of a common register stove. The objection to this grate is its want of neatness and artistic form, and the disposition which the bars have to become loose, from the constant expansion and contraction to which they are subject. Scarcely any tie will keep the front long in its place. It is, however, well adapted for economical families in their sitting-rooms, and for occasional use, as in bed-rooms, &c., where its cheap price renders it desirable.

(*b*) *Open stoves* are intended to burn coal and radiate heat without any loss either by contact with the walls, or by radiation up the chimney. They consist of an iron chamber having bars below and in front, for admitting the air necessary for combustion, which is allowed to escape by means of a small flue issuing from the back, and passing horizontally into the chimney. This flue is the only point of contact with any part but the floor, and as heat does not descend to any appreciable extent, it is the sole conductor of caloric; it is also so small as to forbid the escape of more caloric than is conveyed of necessity in the heated results of combustion. A stove is now made on this principle, and is very commonly in use in our churches, and in large shops, in which the flue is made to ascend and then descend by the sides of the stove, until it passes out either below the floor or a very little above it, and in its transit allows a still greater portion of the caloric to escape into the apartment. This stove, if made with fire-brick sides dividing it from the lateral chambers, so as to prevent the annoying smell occasioned by air passing over hot iron, is exceedingly well adapted to any purpose connected with the subject to which I am now adverting, and it is certainly much better fitted even for ordinary sitting-rooms than any register grates with which I am acquainted, not even excepting Dr. Arnott's. It presents a cheerful fire, it will burn small coal as well as large, it is exceedingly economical in every point of view, and it may be made as ornamental as any other kind of warming apparatus. It is a slight improvement only upon the original Franklin stove; which, however, is objectionable from being made wholly of iron, so as to give a very unpleasant smell to the air, a defect common to all the varieties of stoves used in America.

(*c*) *Closed stoves* are intended to afford heat by warming the air in contact with them, but without any direct radiation of heat from the fuel itself. In all of them small coal, coke, or charcoal, is used in an iron or earthen chamber, with a closed door, and the results of the combustion are led into a chimney after sundry contortions intended to allow time for the whole of the caloric to be imparted to the surrounding air. Great numbers of these stoves have been invented with all sorts of forms, all, however. being modifications of the same principle. Dr. Arnott attempted to improve upon it by the insertion of a chamber of fire-brick within the outer iron case, and carrying the heated gases off by means of a flue in the ordinary way. At the same time he attempted to modify the introduction of the air by means of the expansion and contraction of a metal bar, which opened and shut an air valve; but though very pretty in theory, they do not in practice answer the expectations which were formed of them, and are not at all superior, in my opinion, to any of the old forms of closed stoves, whilst they are much more difficult to light and keep in, and are constantly requiring the attention of the servants. They are intended to burn coke only, and may with great attention and care be made to carry out the objects of the inventor. Their great disadvantage is, that they dry the air too much, as is the case with all stoves; and as they do not ventilate the apartment to any extent, they are not adapted for the warming of any inhabited room; but for halls they will answer well enough, though even here I should much prefer the open stove (*b*).

(*d*) *A hot-air apparatus* is often applied to the purpose of heating churches, or other large buildings; but it is scarcely applicable to houses, the parts of which are inhabited differently at different times. The principle consists in taking advantage of the change of specific gravity occasioned in air by heating it, and thus, by applying fire-heat to a chamber full of air, causing its contents to ascend and draw fresh air from a lower aperture. In this way, by carrying a tube from the heated chamber to any room above its level, a current of warm air may be directed into it. But there is also another mode which is adopted in hot-houses, in which the warm results of combustion are carried through a long and tortuous pipe of brick-work, winding round the inside of the walls of the hot-house, and radiating heat in all directions. This latter mode is not suited to dwelling-houses, because it is not thought desirable to have a long range of brick-work occupying the sides of our rooms, and because we are so accustomed to the sight of a fire that we miss its cheerfulness, and however warm we may be, still we should sigh for some sign of a fire being in operation. These are, after all, the only valid objections to this mode of warming, which may be made so economical that a whole house might be kept at a high temperature for the cost of a single open fire. *A combination of the open grate with the warm air* *apparatus*, is now very commonly adopted in houses of all classes, from the highest to the lowest. The following remarks upon this plan, as well as some of those already made on the ordinary register grate, are from a very interesting paper read in 1855 before the Royal Institute of British Architects, by S. E. Rosser, C.E. In this paper the labours of previous writers are arranged with great care, and though short, it forms a complete summary of our past knowledge on the subject:—"Several fire-places are described in which the back, jambs, and hearth are made with hollow spaces, or caliducts, for the purpose of warming a copious supply of external air, afterwards admitted into the room by an opening controlled by a valve or regulator. The variety of modes in which this plan may be applied renders it extremely valuable. Adjoining rooms may be heated from one fire-place in the partition wall; for by making a fire in one room the heated air from the caliducts may be discharged into the other, or the warmed air may be conveyed to any of the upper rooms. The Polignac fire-places were constructed for the consumption of wood fuel; but Dr. Desaguliers modified them so as to admit of coal being burnt. His fire-places were much appreciated for a time, but subsequently fell into disuse from the supposition that they burnt the air. It is possible that the more intense combustion of a coal fire in a grate might give to the iron-plates that formed the sides of the caliducts a higher temperature than they had in the Polignac fire-places, but with the large proportions which he gave to his air channels this result might be avoided. Many contrivances, similar in principle to Savot's (1626) and Polignac's grates, have been brought forward; and Dr. Franklin (1745) invented a stove, known as the Pennsylvania stove, which combined, to some extent, the peculiarities of Polignac's arrangement with the descending flue in Prince Rupert's stove. The proportions of the caliducts, however, in Franklin's stove make it rather questionable whether it did not overheat the air. It is said of one of these stoves, which was adapted to burning coal, that it kept a room 14 feet square at a temperature of from 60 to 64 degrees for 13 hours, with a consumption of one peck of coals, the external temperature being 28 degrees. M. Peclet's work, *Traité de la Chaleur*, chapter 13, contains descriptions of several fire-places for utilising a portion of the heat which passes off with the smoke, by applying it to warm a supply of fresh air for the apartment. It is possible to modify these arrangements in very many ways. The conditions to be observed are, to dispose the heated surfaces so that they may be efficacious, to give a sufficient area to the air ducts, and, lastly, to render the tubes and the joints sufficiently tight that the smoke may not mix with the warm air. These treatises show the attention which the subject of the economy of fuel has received in other countries. It is probable, however, that in our own country there are few architects or scientific men, who have not themselves tried or seen the results of experiments conducted with the same object. It has occurred to some to increase the amount of effect derived from the combustion of fuel, in ordinary fire-places, by admitting the external air to an enclosed chamber at the back of the fire-place, where it becomes warmed by contact with the cheeks of the grate, and is then admitted into the apartment through perforations in front of the grate. Where a spare flue exists in the chimney breast, the warm air may be conveyed through it, and discharged through an opening near the ceiling of the same apartment, or conveyed to an adjoining room, or to one on an upper floor. Air flues constructed in the chimney breasts when a house is built, would materially promote the comfort of the inhabitants. These flues might have openings at bottom communicating with the external air; and if they were carried up alongside the smoke-flues from the different fireplaces, or connected with the void spaces round the grates, a considerable portion of the waste heat, usually escaping by the chimney, would be communicated to the air in the flues. Apertures should be made into them at their upper part, to communicate with the various rooms, and a continuous supply of tempered air might thus be provided to maintain salutary ventilation, to supply the requisite quantity of air to the fires, and to afford an increased degree of warmth. Chimney openings have not generally a sufficient depth to receive grates of the most efficient kind. The practice of making the breasts project into the room, and the necessity for restricting the projection to the smallest limit, have led to the modern custom of making the recess of the chimney opening only a brick and a half in depth. If all the flues were built in the party-wall, no chimney breast would be required above a projection of a brick, or half a brick, at the fire-place itself, which might be concealed by, or form part of, the chimney-piece. Where fireplaces are situated in an external wall, the difficulty of providing a supply of air is not felt, as a hole may generally be made directly through the wall at the back; but as in town-houses, they are generally formed in the party-walls, independent flues must be brought up for the purpose by the side of the chimney breasts, and openings cut through the jambs. Where there are several stories it would be difficult to supply air to the upper rooms, as the smoke-flues from the lower rooms would generally interfere between the air-flues and the fire-place. In some cases an air-flue might be formed in the floor, by using the space between two joists in connection with a grating in the outer wall, and carrying an iron pipe three or four inches in diameter under the hearth through the trimmer and trimmer-arch into the space behind the fire-place. This arrangement, however, requires the trimmer-joists to be strengthened; and in London the Building Act might probably prevent it, while the supply of air so obtained would be less than is desirable. It is, however, possible in most cases to make some arrangements for the supply of air; but it would be preferable that adequate provision should be made in all new houses, either by air-flues in the party-walls, or by other modes which will suggest themselves to the architect."

(e) *By means of hot water*, also, rooms or whole houses may be warmed; but the apparatus is very expensive, and being liable to leak or burst it is not either safe or desirable. The principle is very applicable to hot-houses, because there a leak is easily discovered, and as the pipe is in sight it is as readily mended; but as in our rooms these must be concealed, there is a constant fear of injury to walls, paper-hangings, &c., from the escape of water or steam. When it is determined to heat in this way, it is only necessary to introduce a certain number of double pipes round the room beneath the skirting-board, and to circulate hot water through them by means of the same principle as is adopted in heating the water of hot-baths, hot-houses, &c. It is, however, by no means an economical mode of imparting heat, because there is a great loss of this in the upper cistern, unless that reservoir of water is required for any other purpose.

(*f*) *Gas stoves* are now becoming very generally introduced as a means of heating halls, shops, &c.; and, I am told, economically, though I am rather incredulous on this score. Numberless forms are offered to the public, but all of them are radically the same, the gas being simply burnt in an iron chamber, and the results being either suffered to escape into the apartment, or else carried off in the ordinary way by a flue. To the former mode there is a great objection, inasmuch as the products are injurious if respired, and though incapable of causing great injury in an open shop, yet in a dwelling-house they ought never to be allowed to escape. A small tube may always be arranged for this purpose, and as there is no danger of fire, it may be carried even through wooden partitions in perfect safety, if not in contact with them. A very ingenious form of gas stove was introduced some years ago by Mr. Edwards, in which gas is burnt by passing it in a number of small jets through a cone of porcelain, which soon becomes red hot, and radiates heat very rapidly. It is, I believe, the best gas stove yet invented, but its high prime cost will always militate against its general introduction. Messrs. Dean and Dray, of London, have lately introduced an ornamental gas stove, which is said to be free from all objections. It is made of glass, with a dome of the same material; but, nevertheless, the products of combustion pass into the room, and it is, therefore, in no way superior to the ordinary gas stove without a flue, and is far inferior to those which are provided with that necessary appendage.

(*g*) *Open fire-places heated by gas* are now adopted for the sick-room, for which purpose they are admirably adapted, though their great consumption of gas, in proportion to the heat thrown out, will always make them too expensive for common use. A register-grate of the ordinary construction has a gas-pipe conducted into it, and ending in a number of burners in the middle of the grate. Upon these are loosely arranged a series of clinkers of a peculiar formation, and these heated by the gas become red-hot, and give out a heat sufficient for the bedroom; but the fire is not so warming and cheerful as that from common coal. It has, however, the advantage of being free from dust and smoke; and as the gas can be turned down or up at a moment's notice, it may be husbanded with care, so as to cost much less than it would do if constantly burnt at the full rate which is required to make a good fire. There is also another advantage attending upon it, consisting in the absence of noise which attends the ordinary fire from the fall of cinders, and which, to an irritable or watchful invalid, is often sufficient to prevent sleep; so that, on the whole, it may be strongly recommended as an excellent kind of fire for the sick-room, where its expense is no objection.

GRAVEL.—A deposit of small crystals from the urine.

GRAVEL, Varieties of, 103; symptoms of, 104; treatment of, 447, 449.

GRAVY-BREAD, as a food for invalids, 247.

GREEN SICKNESS.—See *Chlorosis*.

GREGORY'S POWDER.—A mixture of rhubarb, magnesia, and spice. See *Mild Aperients for Children*, 268.

GRIPING.—This well-known sensation in the bowels is a symptom of diarrhœa, dysentery, and colic. It also accompanies the action of many aperients, and to counteract this effect, carminatives are added, such as ginger, and the warm essential oils.

GROATS.—See *Oatmeal*, 605.

GROWTH.—See *Nutrition*.

GRUEL, Preparation of, 283.

GUAIACUM WOOD AND RESIN, 234; mixture of, 239.

GUINEA-WORM (*filaria Medinensis*), 159; removal of, 486.

GULLET (*Æsophagus*).—The tube leading down to the stomach. See *Alimentary Canal*, *Spasm of*, 91.

GUM.—A vegetable substance produced by various trees, as *gum-arabic*, *gum tragacanth*, &c. It is soluble in cold water, forming a viscid and adhesive solution called *mucilage*.

GUMS.—These are the condensed cellular and mucous membrane which covers the alveolar processes of the jaw before the eruption of the teeth, and envelop their fangs afterwards. They are subject to congestion and inflammation, as well as to ulceration, abscesses, and the other consequences of the former condition.

GUMS, Sponginess of the, 166; treatment of, 492.

GUM-BOIL, Treatment of, 492.

GUMS, Lancing of the, in infants, 287.

GUN-SHOT WOUNDS, Treatment of, 399.

GYMNASTICS.—See *Kinesipathy*, 209.

HABITS, National and individual, 4, 5.

HAIR, Formation of, 46; diseases of the, 73; treatment of, 391; management of the, in children, 307, 308, 309.

HAIR-GLOVE.—A glove woven of coarse horse-hair, with the loose ends left on. It is used to cause some degree of irritation of the skin, in certain diseases, as well as to promote its health by removing the superfluous cuticle, and by stimulating its vessels to a proper degree of action.

HANGING, Attempted, treatment of, 512.

HARE-LIP, Nature of, 165; treatment of, in infants, 335.

HARROWGATE.—A watering-place in Yorkshire, celebrated for its saline springs, which are impregnated with sulphuretted hydrogen gas, iron, and other matters. They are especially useful in skin diseases and scrofula. See *Climate*.

HARVEST BUGS. — Small *acari* which burrow in the skin during the period of harvest, and produce most intolerable itching and a little red pimple. If this is carefully pricked the insect may be picked out with a needle, and will be found to resemble a small red spider. The best application for the relief of the itching is the lotion ordered for the stings of insects, 400.

HARTSHORN.—The popular term for *liquor of ammonia*.

HASTINGS.—A celebrated watering-place on the Sussex coast. See *Climate*.

HASTY-PUDDING, Receipt for, 293; baked, *ib*.

HAY FEVER, or *Asthma*, is a peculiar form of bronchitis, which occurs about the time of the hay harvest, and appears to be connected with the pollen of wild plants, or with some emanation from them, since it is never met with in situations where there is no vegetation. Nothing seems to exercise any curative power over it; and the patient must either be content to let nature have her way, or remove to a different locality.

HEAD, Determination of blood to the, 118; treatment of, 458.

HEAD-ACHE, Varieties of, 125—as the rheumatic, 126; congestive, *ib.*; dyspeptic, *ib.*; periodic, *ib.*

HEAD-ACHE, Treatment of the various kinds of, 463.

HEADLAND, Dr., his theory of the action of medicines, 185, 186; his propositions, 187 *et seq.*; his classification of remedies, 189 *et seq.*

HEALTH, General laws for the regulation of, 1 *et seq.*—as definition of, 1; influence of temperament on, 2; climatic and epidemic influence on, 4; preservation of, by means external to the body, 6, 12; by internal means, 13, 18; medicines used as a means of promoting, 17, 18; various auxiliaries to medicine for the restoration of, 246 *et seq.*

HEARING, Sense of.—This important function should be carefully preserved from injury, as upon it depends in great measure our social comfort and happiness. Blindness is, no doubt, a severe affliction, but entire deafness appears to be still more unbearable, from the deprivation of all mental intercourse which it occasions. The blind are proverbially cheerful, while the deaf are generally the reverse, and are subject to constant suspicions of designs against their peace of body or mind. In order to understand the nature of the function called "hearing," that of "sound" must to a certain extent be first studied.

(*a*) *Sound* is the result of any impulse conveyed by the air or other medium to the ear; the former being that which is generally employed upon the human organ, though its effects may be imitated by touching the *drum* with a fine probe, when a sensation of sound will be communicated. A *noise* is an irregular impulse of the air, as a *musical sound* is a succession of impulses, which occur at exactly equal intervals of time, and which are similar in duration and intensity. When these impulses succeed each other with great rapidity, they appear to give a *continuous sound*, but this requires that the number of them per second should be about sixteen. *Musical sounds* are distinguished according to their *pitch*, their *intensity* or *loudness*, and their *quality*. Sound may be communicated by air or similar gaseous mixtures, as well as by liquids and solids. Water transmits sound, and fishes have distinct organs of hearing. Solids are readily proved to have this power, by placing a watch at one end of a long log of wood, and the ear at the other. *Sound is reflected* either partially in passing from one medium to another, or wholly when it meets with a solid obstacle, in which case an "echo" is produced, in both cases being governed by nearly the same laws as light.

(*b*) *The organ of hearing* in man is described under the head of the *Ear*, but the whole of its complex mechanism, as displayed in his organ, is not essential to the production of hearing. A part of it is, however, found in all animals, in which an apparatus for this special function is observed, namely, that called the vestibule. Here is the seat of the faculty, and here will be found the principal expansion of the auditory nerve. In some of the crustaceans, whose simple ear is the lowest in organisation, the sound is conveyed to the vestibule or cavity through the solid material in which it is encased; and in the more highly organised fishes, the labyrinth constitutes the whole of the auditory apparatus, having also no opening or communication with the external air, and being lodged in the walls or cavity of the cranium, the sonorous impressions must be made through them. The presence of the cochlea is an indication of an advanced condition of the organ of hearing; but beyond this, we have little knowledge of its special use, though it is supposed by some physiologists to take cognizance of the sounds conveyed through the vibrations of the skull. The three semi-circular canals and the vestibule appear to be the parts which are more especially in connection with the ordinary vibrations of the air as conveyed to the *drum;* and it is supposed by Professor Wheatstone that the *direction* of sounds is made out chiefly by the former of these parts. The external ear is chiefly useful in collecting the vibrations; and in the majority of the mammalia, it is made moveable for that purpose, and is directed by muscles to the quarter from which sounds come. The *tympanum* and its *drum* (*membrana tympani*) receive the vibrations from the air, and convey them to the *fenestra ovalis* of the vestibule by means of its chain of small bones, which, while they keep the drum in a proper state of tension, also have this power. Nevertheless, the entire condition of the drum is not essential to hearing, and Sir A. Cooper proved by experiment, that its removal sometimes improves the faculty instead of destroying it. The *Eustachian tube* maintains the air in the middle ear in the same degree of pressure as on the exterior of the drum, and also allows it to vibrate freely. With regard to the *nerves*, they consist of those which receive the sonorous impressions, and of others which supervise the mechanism of the organ.

(*c*) *Summary* of the modern theory of hearing, according to Dr. Todd:—

"1st. *The vestibule* is the essential part of the organ. It detects the presence and intensity of sound, and especially of those sounds conveyed through the external ear and tympanum.

"2nd. The *cochlea*, lying in immediate connection with the bone, receives those sounds which are propagated through the bones of the head. According to Kerner, it is

Fig.1.

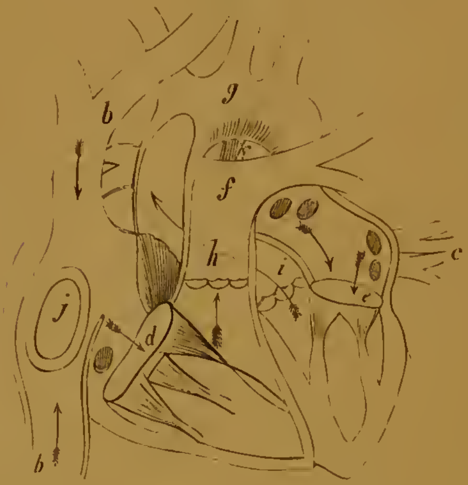
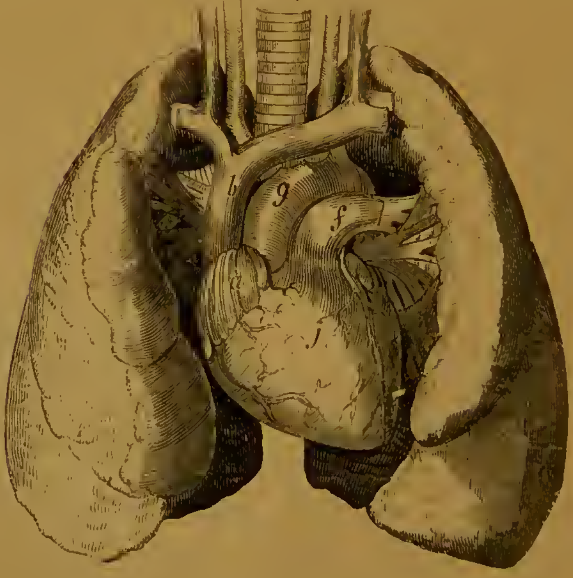


Fig.3.

Fig.2.



DIAGRAMS OF THE HEART. P. 625.

the medium of the perception of the *timbre*, or quality of sounds.

"3rd. Of the function of the semicircular canals we know nothing. That they aid in forming a judgment of the direction of sounds is conjectured by Autenrieth and Kerner, and more recently by Wheatstone.

"4th. The *tympanum* and its membrane render the internal ear independent of atmospheric vicissitudes, and the former affords a non-reciprocating cavity for the free vibration of the latter, as well as of the chain of *ossicles.*

"5th. *The chain of ossicles* acts as a conductor of vibrations from the *membrana tympani* to the *fenestra ovalis*, and under the influence of the muscles regulating the tension of the *membrana tympani* as well as the membrane of the *fenestra rotunda*, so as to protect the ear against the effects of sounds of great intensity.

"6th. *The external ear* and *meatus* are conductors of vibrations — the former in some degree collecting them as a hearing trumpet would do, and probably assists in enabling us to judge of the direction of sounds."—*Cyclopædia of Anatomy.*

HEART, Anatomy and Physiology of the.—In all animal bodies there is a movement of the juices which are intended to nourish them, whether this is merely in the simple sacs of the lowest forms, or in the complex circulating systems of the highest. In proportion as the veins and arteries become complicated, a more rapid and complete circulation of these fluids is required, and hence we find in the higher animals a pulsatory hollow organ called "a heart," by which they are driven in a circuit, or sometimes only to and fro. As we rise in the scale, we find this heart divided into two distinct portions, one of which is strong and muscular (the *ventricle*), and the other thinner, though still capable of muscular contractions (the *auricle*). The latter receives the blood on its return, and supplies the former, which then contracts, and forcibly drives it into the body—the blood being prevented from returning by a valve situated between the two. This is a perfect *single heart*, such as is seen in fishes, while in reptiles it is further complicated by having two *auricles*, one of which receives the blood from the lungs, and the other from the rest of the body. Lastly, in the *mammalia* and *birds*, we have two distinct hearts, each consisting of an auricle and ventricle, and in the adult state having no communication with each other, though apparently so connected as to appear one organ. Such is a general view of the heart as found in the different classes of animals; it now remains to examine into its *anatomy* and *physiology* in man.

(*a*) *The anatomy of the human heart* is somewhat complex. It is of an irregularly triangular shape, placed obliquely in the chest, as shown in the diagram (*fig.* 1), the *base* being directed towards the right shoulder, and the apex opposite the space between the fifth and sixth ribs, two or three inches to the left of the sternum. Its under-side rests upon the diaphragm, and it is maintained in its position, and protected from pressure by a strong fibrous tent (the *pericardium*), which is attached all round to the tendon of the diaphragm, and above to the large vessels as they rise from the heart, and on a level with the arch of the aorta; so that, as their connections with the neck are strong and elastic, by means of the carotid and subclavian arteries *and their sheaths*, so this tent is firmly suspended from above, and during life is kept tense, just as the soldier's tent is by the pole. In both diagrams the pericardium is entirely omitted. The heart itself may be viewed as a complete double pump, the two machines, however, beating at the same moment of time, and thus acting equally on the circulation of the blood, all of which passes through each. These two machines are called respectively the right and left side of the heart, the former containing black (*venous*) blood before it has gone through the lungs; the latter red (*arterial*) blood, after it has returned from them. Each side consists of an *auricle* or receiving chamber, and of a ventricle or pumping machine, and each is guarded by valves, which are similar in principle, though somewhat different in detail, on the two sides. The *auricle* (shown at *a*, *fig.* 2) is a thin but muscular bag, receiving the blood on the right side from the *venæ cavæ* (*b b*, *figs.* 1 and 2), and on the left from the pulmonary veins (*c*, *fig.* 1). When the auricle is filled, it contracts and drives its blood partly into the ventricle and partly back again into the veins, as may be seen on looking at the jugular vein of a child where a pulsation will be very perceptible, known by the name of the "venous pulse," and consisting in this regurgitation. This contraction of the auricle is called its *systole*, and is contemporaneous with the *diastole* of the ventricle, which being filled contracts at once with the sharp and sudden action known as the *ventricular systole*, by which the blood, being prevented from returning into the auricle by the valves (*d e*, *fig.* 1), is forced into the two large arteries known as the pulmonary artery (*f f*, *figs.* 1 and 2) on the right side, and the aorta (*g g*, *figs.* 1 and 2) on the left. Each of these arteries is furnished with three valves at its root (see *h i*, *fig.* 1), which are very complete in their formation, and resemble little membranous bags, so arranged as, when there is any regurgitation, to assume the appearance shown at *fig.* 3, which is a diagram of the section of the vessel above or below them. The valves between the auricle and ventricle (*auriculo-ventricular*) are partly composed of a thin fold of strong membrane, and partly of tendinous cords stretched between them and some bundles of muscular fibres, which have the power of keeping them properly stretched. Thus, it will be seen that the mechanism of the heart is that of a common pump, with this difference, that instead of the blood being drawn in by the piston, it is forced in by other means, of the nature of which there is a great difference of opinion. That any derangement of its valves should cause great distress cannot occasion surprise, when it is considered that the slightest defect will interfere with their proper closure, and consequently with the regular circulation of the blood, and the only wonder is that so many of us go through life without any disorder of its action, further than that accompanying fever and inflammation, which is merely an increase of frequency in its pulsations. There are many other minute points in the anatomy of the heart, which it is unnecessary to enlarge upon here, further than to remark that the left side having to drive the blood into the body generally has considerably thicker walls than those of the right, which have only to propel it through the lungs.

(*b*) *Before birth*, as the lungs do not inspire air, there is no necessity for a circulation through them, excepting for the purposes of nourishing their substance to such an extent as to ensure their proper growth. Hence a provision is made for diverting the blood from the right side to the left without passing through them, and this consists—1st, in an oval opening which exists between the right and left auricle (*foramen ovale*, see *fig.* 1, *j*), and which allows part of the blood returning from the body to pass at once to the left side of the heart; and 2nd, of a short duct between the pulmonary artery and the aorta (*ductus arteriosus*, *fig.* 1, *k*), by which the blood of the pulmonary artery, instead of going on to the lungs, as it does after birth, passes direct into the aorta, and is again circulated through the system—thus, in fact, making the heart a single organ at this period of existence. As soon as respiration is established the foramen ovale is gradually closed by the contraction of a valve or curtain drawn over it, and the ductus arteriosus diminished to an impervious cord, in which condition it remains in after-life. If these closures do not take place, the child is subject to what is called the blue disease, 278, since the blood does not pass regularly into the lungs, and is not there renovated by respiration, as it must be in order to carry on life without the aid of the maternal circulation.

(c) *The physiology of the heart* can only be understood by comparing its structure, as examined after death, with its action during life. The former has been already entered into, and the latter must now be the subject of inquiry. In the healthy living animal, the movements succeed one another with great rapidity and regularity, and with scarcely any pause between them. The contraction of the auricle (*systole*) takes place at the same moment that the ventricles are dilating (*diastole*); and again the diastole of the auricles corresponds with the period when the ventricles are contracting (*systole*). The systole of the ventricles is the cause of the propulsion of the blood into the arteries, and of the arterial pulse, as well as of the impulse of the heart against the side of the chest, which is produced by a change in its form and hardness at the moment of contraction. The *systole* of the ventricles is followed by their *diastole* without any interval; but prior to the *systole* of the auricles, there is a very short space or interval of time. Each of these actions is attended by corresponding sounds, which are heard when the ear is placed upon the left side of the chest, either with or without the intervention of the stethoscope. At the moment when the impulse is felt, a dull and prolonged sound is heard, which is termed the *first* sound of the heart, and marks the *systole of the ventricles*. Immediately after this comes a short sharp sound which corresponds with the first stage of the *diastole of the ventricles*, and before the auricles have begun to contract. Next comes a very short interval in which no sound is heard, and then the first sound is repeated, and the same goes on with never-failing regularity, so long as the organ is in a healthy state. These sounds are supposed to be caused as follows:—The *first* is in part due to the impulse of the heart against the walls of the chest, and in part to the muscular contraction of the walls of the ventricles upon the contained blood, as well as to the rush of blood through the openings of the arteries. The cause of the *second* sound is to be referred to the sudden filling out of the semi-lunar valves with blood, at the moment when the ventricles have ceased to contract, and when the blood, having a tendency to return into the heart, is prevented by them from doing so, producing a "clicking" sound which is readily distinguished. *The quantity of blood* propelled at each systole is supposed to be about two ounces or somewhat less, and as the whole mass of blood in an adult male is calculated at about 28 lbs., if we allow 75 pulsations per minute, 150 ounces would pass through the heart in that interval of time, and consequently the whole mass of blood would go through the circulation in three minutes. By experiment, however, it is found that the time required is even less than this, for if a coloured solution is injected into the veins near the heart, it is found in the arteries in twenty seconds, during which interval it must have passed through the lungs, and after being returned to the heart, have gone through the large arteries to reach its position. *The force* of the heart in propelling its blood is very considerable, and in the horse it is sufficient to raise a column of blood to the height of ten feet, while in man it is supposed to be capable of raising one to the height of seven feet and a third. *The number of contractions* per minute is liable to great variations without any disturbance of health, depending upon age, sex, muscular exertion, mental actions, the state of digestion, and the period of the day. *With regard to the cause of the move-*

ments of the heart, they are attributed to a constant supply of nervous influence, generated by the brain and other nervous ganglia, and transmitted through the sympathetic nerve, which supplies a great number of branches to the heart. And from this circumstance it happens that sudden injuries to any one of the great ganglia deprive the heart of its nervous stimulus, and it ceases to beat; so that a blow on the head, or on the stomach, will equally deprive the heart of its active power, and immediate death is the result, the former producing its fatal influence by the injury done to the brain, the latter by its effect upon the great semi-lunar ganglion and its branches, supplied to the heart.

HEART, Symptoms of chronic diseases of the, 144, 145; of rheumatic inflammation of the, 89.

HEART, Treatment of chronic diseases of the, 476; of acute rheumatism attacking the, 417.

HEART-BURN.—A disagreeable burning sensation experienced in the throat by some people, when any kind of food has disagreed with the stomach, and produced an unusual formation of acid. It is a symptom of ordinary dyspepsia, or of pregnancy, in which it very often occurs. Any alkali gives relief, by neutralizing the acid in the stomach; but this does not always entirely remove the sensation. Five or six grains of magnesia, with a grain or two of ginger, will generally afford the greatest amount of relief, or in some people the bicarbonate of soda will answer better, while others, again, fly to lime-water as their best friend. In mere dyspepsia, the attention to the stomach, and the adoption of means which will give it tone, are far better than any temporary palliative such as those mentioned above; but in cases of pregnancy, they may be resorted to without compunction, as heart-burn always disappears after delivery, and there is, consequently, no danger of continuing these remedies too long.

HEAT.—See *Caloric.*

HECTIC FEVER, Symptoms of, 30; treatment of, 359.

HELLEBORE, White, symptoms of poisoning by, 176 (*par.* 596); treatment of, 511.

HEMATEMESIS (*vomiting of blood*), Symptoms of, 146; treatment of, 478.

HEMIPLEGIA (*a form of paralysis*), Symptoms of, 125; treatment of, 462, 463.

HEMLOCK (*conium maculatum*), medical properties of, 231; symptoms of poisoning by, 177; treatment of poisoning by, 511.

HEMLOCK POULTICE, 242, 264.

HEMOPTYSIS (*expectoration of blood*), symptoms of, 146; treatment of, 479.

HEMORRHAGE, General remarks on, 145; symptoms of various kinds of, from disease, *ib.*—as active and passive hemorrhage, *ib.*; congestion, *ib.*, ulceration, *ib.*; hematemesis, 146; hemoptysis, *ib.*; bleeding from the small intestines, *ib.*; bleeding from the large intestines, *ib.*; hemorrhage from the kidneys, *ib.*; menorrhagia, *ib.*; vicarious hemorrhage, *ib*

HEMORRHAGE, Treatment of, from the bowels in fever, 358; from wounded vessels, 477; from disease, 478 *et seq.*—as active hemorrhage, 478; passive hemorrhage, *ib.*; from ulceration of the coats of a vessel, *ib.*; vomiting of blood, *ib.*; hemoptysis, 479; bleeding from the intestines, *ib.*; from the kidneys and bladder, 449; menorrhagia, 494; flooding, 499.

HEMORRHAGIC DIATHESIS, Nature of, 145; management of, 477.

HEMORRHOIDS (*piles*), Symptoms of, 143; treatment of, 474, 475.

HEMP.—See *Indian Hemp.*

HENBANE (*hyoscyamus niger*), Extract of, 233; tincture of, 245; treatment of poisoning by, 511.

HEPATIC.—Relating to the liver (*hepar*).

HEPATITIS (*inflammation of the liver*), Symptoms of acute, 99; chronic, 100; treatment of acute, 442; chronic, 443.

HEREDITARY DISEASES AND PECULIARITIES are those which are inherited from the ancestors of the individual suffering from them. Thus, a peculiar formation of the body or the mind is often transmitted through several generations, either occurring in all, or sometimes alternately, or in others with still greater intervals. The diseases which are chiefly handed down in this way are scrofula (including pulmonary consumption and mesenteric disease), gout, insanity, asthma, cataract, calculous complaints, and hemorrhoids, with which last may certainly be included constipation as their almost invariable accompaniment and cause. If both parents have a tendency to any one of the above diseases, the chances are greatly increased that the offspring will inherit it; while, on the contrary, if they have each a different diathesis, some of the family may expect to inherit one, and some the other, or they may possibly escape them both. It is partly from the prevalence of particular diseases in families, that intermarriages are so likely to be followed by an increase in their development in the next generation, aided also by the well-known enfeeblement of body and mind which is the common result of that pernicious practice.

HERNIA (*rupture*), Nature of, 426; treatment of, 427.

HERPES (*tetter*), Symptoms of, 62; treatment of, in children, 311; in adults, 384.

HERRINGS.—See *Fish*.

HICCUP, Nature of, 91; treatment of, in children, 316; in adults, 418

HIP-BATHS, 254, 255.

HIP-JOINT.—The joint between the thigh-bone and the pelvis. It is a deep ball-and-socket-joint (see *Joints*), the cup of which is formed in the pelvis at the junction of its three bones, while the ball is situated at the extremity of the thigh-bone, and on the neck which forms an angle with it (see *Skeleton*). By this formation it is capable of very extensive motions without much danger of dislocation, though this accident does occasionally happen. The two bones are held together by strong ligaments and muscles on the exterior, as well as by a short and strong fibrous band in the interior of the joint itself (*ligamentum teres*), which is attached to the middle of the cup as well as to the end of the ball. The muscles, however, are the great protectors of the hip-joint, and when they are removed it is found that a very little force, comparatively, will twist the bone out of its socket.

HIP-JOINT, Symptoms of scrofulous disease of the, 138; treatment of, 326.

HIP-JOINT, Chronic rheumatism of the, 90.

HIP-JOINT, Symptoms of dislocation of the, 424; treatment of the various kinds, 424, 425.

HOMŒOPATHY, 192 *et seq.*; claims of, 192; evidence for and against, 193; conclusions on, 199 *et seq.*

HOOPING-COUGH, General symptoms of, 49; of congestive, *ib.*; inflammatory, 50; treatment of, in children, 304; in the adult, 376.

HOP (*humulus lupulus*).—The well-known plant used in brewing (see *Malt Liquors*).

HOP, Extract of, used in medicine, 233.

HOP-PILLOW.—When there is great watchfulness, a pillow filled with hops as new as possible, and well pulled to pieces, so as to render it tolerably soft, will sometimes produce an anodyne effect without any attendant bad symptoms.

HOREHOUND (*marrubium vulgare*).—An indigenous plant growing by the road-side. It is about eighteen inches high, everywhere covered with a hoary white woolliness; flowers, small, white, and in crowded whorls. The plant has a peculiar aromatic odour, and a bitter balsamic taste. Its medicinal properties depend on a volatile oil and extractive matter, which are dissolved by boiling water and alcohol. It is a common domestic remedy in chronic coughs, and is either used in the shape of *horehound tea*, which is prepared by infusing an ounce of the fresh herb in a pint of boiling water for an hour, and then sweetening it with sugar (a sixth or a quarter of it is given two or three times a day, or at night only with the addition of a few drops of laudanum or half a tea-spoonful of paregoric); or it is *candied* by evaporating the water from the syrup made in the same way as above described, and leaving the herb in the usual shape of candied preparations, when it is called candied horehound, and of it a quarter to half an ounce is slowly eaten at night, or when the cough is troublesome.

HOREHOUND TEA.—See the above article.

HOREHOUND, Candied.—See also the above article.

HORSE-RADISH, 234; infusion of, 235; compound spirit of, 244.

HOUSE, Situation of.—Both in preserving health and in treating disease, the situation of the house is of the greatest importance, independently of the locality in which it is placed, which is referred to under the head of *Climate* and *Change of Air*. Wherever, therefore, there is a choice, whether in the search of a dwelling for the sick or for those in good health, attention should be paid to certain circumstances, which will be presently mentioned. In towns there is not often much choice, because few people prefer to live within their actual precincts, and if they are compelled to do so, they are generally confined to some limited area in making their selection. In them drainage is the chief consideration, united with as airy a spot as can be found; but in the country, or in suburban situations, four things must especially be sought for—namely, (*a*) good air, (*b*) good drainage, (*c*) a good soil, and (*d*) good water; while, in every case, the aspect (*e*) is of the highest importance. Each of these points, therefore, shall be separately considered.

(*a*) *The salubrity of the air* is in a great measure dependent upon the soil, the amount of foliage, and the elevation of the district, all of which should be investigated. Our ancestors were very fond of selecting for their houses low, sequestered, and richly-wooded dells, which, being warm and sheltered from the winds, were suited to their style of building, and to the habits of those days. In the first place, much more time was then spent in walking and riding on horseback than at present, coaches and carriages being rare conveniences; in the second place, windows and doors were much less closely fitted than is now the case; and in the third place, the *general* growth of timber was not then what it now is, or rather was, in many counties. In most districts, the timber was collected in large woods, and the hedge-rows were not so filled with elms and ash-trees as may now be seen in some of our richest counties. The consequence of this last innovation (which fashion is now exploding wherever high farming is practised), is that the air is poisoned by collections of decaying leaves in the ditches, and the health of the inhabitants is affected to a degree which certainly does not produce ague, but dyspepsia and continual headache, with prostration of the mental and bodily strength. Wherever, therefore, it is possible to meet with a high and dry situation, or a gravelly subsoil, yet with sufficient depth of mould to form a serviceable garden, the choice should be greatly biassed in its favour. Trees and dells are very ornamental, no doubt, and I confess that in selecting a site I should be strongly tempted by a pretty spot; but I am quite sure that in *wooded districts* the addition of home foliage is sufficient to turn the scale, and to make that which might otherwise be bearable, a constant source of disease. On the Wiltshire, Berkshire, or Sussex downs, or on the wolds of Yorkshire, a sheltered spot is unobjectionable, and a few trees about the house are not only ornamental but useful. There the air is almost too bracing, and there is not the slightest harm in inhaling emanations from half a hundred trees. But in counties like Somersetshire, Devonshire, Worcestershire, Herefordshire, and great part of Shropshire, together with the wooded parts of Hampshire, the air is everywhere supersaturated with moisture and with vegetable emanations, and if allowed to stagnate about a house, it rapidly becomes more and more deleterious, and produces all sorts of maladies. This consideration must always be taken into account, as nothing is more common than for the man accustomed to woodlands to select a high situation when he ought to avoid it; and, on the other hand, the previous dweller on an exposed situation seeks a retired and sheltered spot in the heart of a wooded district when he ought to look for the most open one at his disposal. It is just the same with the effect of sea-air. To those who have lived in richly-wooded districts, it is a complete panacea for all their ills, not only because it is bracing from its saline particles, which are chiefly useful to the citizen, but because its air is free from the emanations of vegetation. But to the dweller on exposed situations, sea air is often even prejudicial, and instead of affording the relief to the ailments to which he is obnoxious, it aggravates them ten-fold, unless he can find a warm and protected spot like Ventnor, in the Isle of Wight, and some of the secluded nooks on the Devonshire coast. It is astonishing what effect a small difference in the elevation has upon the salubrity of a particular spot. I have known a rise of sixteen feet, and within three hundred yards, produce an entire change from a relaxing to a bracing air. This was partly caused by the lower spot being the bottom of a basin, and completely enveloped in foliage, while the higher was comparatively free from trees, and had a tolerable fall for its surface water and for its drainage.

(*b*) *The subject of drainage* is partially entered upon under the head of *Drainage, Modes of carrying out;* but something more than this is to be considered in selecting a residence in the country. Whenever there is a fall of ten feet to a running stream, the drainage in country houses may always be efficiently carried out, as far as the individual house is concerned; but this is not the only consideration, for the surrounding fields should also be well drained, or they will be constantly enveloped in fogs and become fertile sources of evil. The house-drainage, therefore, I repeat, may be easily provided for if the fall is what I have stated; but the fields cannot so readily be made healthy, unless they are also under the control of the owner of the land on which the house is to be built. The side of a hill is not always a healthy spot, unless the herbage is scanty, and it is free from woods, or unless the surface-water is interrupted by a brook or drain considerably above the level of the proposed site, and carried off in a different direction. No spot, in most cases, is so suited for a house as a slight rise, or knoll, which looks down on all the surrounding land; for here there is no chance of any annoyance from watercourses belonging to other parties, or of malaria arising from stagnant water. Quickly running streams, so long as they are not subject to extensive floods, are never in any way injurious, and may be made the means of carrying off all the unhealthy accumulations of a country residence; but dammed up waters of all kinds, unless there is a good stream through them, and especially stagnant ponds, should be carefully avoided near a house, however ornamental they may be. Flooded meadows, also, are by no means desirable, and especially such as remain wet for a long time after being submerged. It may be gathered from what I have remarked, that I have a horror of water; and so I have, in the wrong place. Water, like fire, is a good friend, but a fatal enemy; and it should be as carefully sought for in the one capacity as it should be eschewed in the other.

(c) *With regard to soil*, gravel or sand in certain situations is highly desirable—that is, when well drained; and with these may be coupled sand-stone or lime-stone *sub*-soils, chalk, and also the primary rocks. These all give good air and some of them good water. Gravel also is desirable as a subsoil on all but very low situations, and even there if it is well drained; but nothing can be worse than a gravel-bed, which is locked in by a surrounding basin of clay, *without any outlet for its rain-fall*. Such a spot is a sponge, constantly accumulating the elements of disease, which are prejudicial both to man and some of the domestic animals, for it is notorious that such a kind of land is peculiarly fatal to sheep. It is not, therefore, the mere existence of a gravel-bed which makes a spot suited to the habitation of man; but it must also be well drained, both superficially and in its subsoil, in order to be fit for his residence. On the other hand, reclaimed lands, in which there is no soil but the peaty remains of decayed vegetation, are peculiarly unfit for the human residence. It is true that every year they become more and more sound, and their inhabitants more and more healthy; and the sturdy men of Lancashire and Lincolnshire may be pointed out as specimens of its growth. But it must be remembered, that there are two districts in those counties, one of which is high, dry, and bracing, while the other is composed of the soil I have been alluding to. In the high lands health beams in every eye, and the step is elastic and firm, if not always graceful. But among the inhabitants of the low districts, the cheek is pallid, the eye sunken and dull, and the step inelastic, while the real height is apparently reduced by a stoop, which amounts in many cases to a crouch. In some of these marshes, as in Essex, Cambridgeshire, and the fens of Lincolnshire, gin is a necessary of life, and is swallowed in incredible quantities without those ill effects which follow its use in more healthy districts. Clay, if properly drained, forms the healthiest of all soils, since it refuses to absorb decomposing animal and vegetable matters, excepting in so far as to convert them to a wholesome food for plants, which it has the property of doing to a marvellous extent. Indeed, when mixed with all soils, but with clay soils in particular, the smell of the most offensive manures is quickly gone, from their absorbing the elements of which they are composed, and converting them into healthy products. But soil must also be regarded in reference to the foundation, which is an essential point, not only as regards comfort, but in reference to health; for if this is not made sound and good, the house soon becomes unsound, and the changes of weather are not excluded. Gravel, rock, and chalk are excellent for this purpose, especially if the whole site to be occupied by the house is composed of the same; but alternating beds of gravel and sand, or of gravel and clay, or clay itself, are not so good—the last, however, being the best for the purpose. The great objection to clay in all its varieties is, that it swells and contracts so much with alternations of wet and dry weather. If the whole house is on one uniform bed which extends many yards in every direction, the only result of this change will be, that it will be bodily raised or depressed to a certain extent; but this is not of the slightest consequence, as the variation of an inch or two in the distance from the earth's centre can make no difference. But if the bed of clay varies in thickness, or if it forms the sloping side of a bank, or if it does not extend far in every direction, it is liable to swell unequally, and thus separate walls into sections, and to make doors refuse to shut or open. The best test of this fact is a pair of gate-posts set on the side of a hill, with a gate fitting them of ten or twelve feet in length. In dry weather this gate will perhaps have a lap of an inch between its latch and the gate-post, while after long-continued rain it will refuse to shut from being too wide. This I have often seen; and I know no remedy for it, except to connect the two gate-posts together by masonry or timber under-ground. It is the same in house-walls which are seen to be tumbling about in the most grotesque manner, in aggravated cases—that is to say, where the walls are built on the surface of an irregular bed, without the proper precautions to which I shall hereafter advert. In the three first soils to which I have drawn attention, no more soil need be excavated than is sufficient for the erection of the house, as for cellars or kitchens, if under-ground; but in clay, in all cases, the foundations should be carried below the reach of ordinary changes from moisture, and this will entail a considerable extra expenditure. Recently made ground is always suspicious, as it is generally the seat of a reclaimed marsh, and, as such, takes many years to be made fit for human habitations. All filled-up ponds are still worse, where their vegetable matter has been buried beneath the surface; but, of course, if they have been properly cleaned out before filling, there can be no objection made to them on that score. When a garden either for flowers or vegetables is desired, the nature of the soil will form an object of inquiry, for in some cases the clay is so stiff and poor as to be wholly unfit for either purpose; and when the occupation of gardening is essential to health, the obtaining a soil fit for a garden is of the greatest consequence, as few people take an interest in a pursuit which is obliged to be carried on under difficulties.

(*d*) *Water* comes very high in the list of requisites in all suburban, as, in fact, in every other kind of residence. A good well of spring water can seldom be reckoned on; but it should be obtained if possible. In most of the suburban districts of London, spring water is almost unknown; and if a well were sunk for every house it would be impossible to procure it. The expense is great, in most cases, which would deter the greater number of builders, especially now when most of the companies supply a perfectly pure and wholesome water, and which is most agreeable to the palate. The improvement in this respect is marvellous within the last year or two, and the health of the inhabitants appears to be proportionally raised in the scale, judging as far as one can do from so short an experience. This subject, however, is more fully entered upon under the article *Water*.

(*e*) *In deciding on the aspect*, we have two things to consider, the prevailing objectionable wind and the sun. In this climate, the wind which we most of us wish to avoid is that from the east or north, sometimes one and sometimes the other being the worst, according to the protection afforded by the nearest hills. Whichever of these, therefore, is the worst, neither the back nor the front should be turned that way, but one of the sides, in which there need be few openings. Again, it is of great importance to health, especially to that of young children, that they should have plenty of sun, and especially morning sun, and therefore a north aspect is not good or cheerful, inasmuch as little sun can be obtained on that side. Neither is a full south or south-west aspect very much to be sought after, because here we have too much of a good thing, and are scorched by his rays; but a south-eastern view of this luminary is the one which commands all the advantages, without any drawbacks, and is that which most people would choose if they could. In this aspect we have the sun upon the breakfast-table, which is the time when children benefit most by his rays, and are rendered by them happy and cheerful for the rest of the day. The nursery therefore should, if possible, be turned to this point; and when the heat of summer comes, there is all the cheerfulness and health which it affords in the morning, without the sultry heat of the afternoon. In towns this is of still greater importance than in the country, and I have often proved the fact by comparing a number of young families on the two sides of a street running east and west. Those which have had the full sun upon their rooms have looked full of life and health, while those with the north aspect have appeared pale and dejected. Sun and air are more particularly needful to all *young* animals, though good for all ages; and the effect of withholding their benefits is really the same as that of placing a plant in a dark cellar, which soon becomes bleached and refuses to grow. The aspects, therefore, which I should choose would be—1st, the south-east; 2nd, the south; 3rd, the south-west; 4th, the west; and, 5th, the east—carefully avoiding any one with a northerly point in it.

HOUSEMAID'S-KNEE.—See *Bursæ, Inflamed.*

HUMERUS.—The bone of the upper arm. See *Skeleton.*

HUMERUS, Treatment of fractures of, 434, 435.

HUNGER, Physiology of, 155.

HYDATIDS, Description of, 159; treatment for removal of, 332, 486.

HYDRARGYRUM, (*Mercury, or quicksilver*).—See *Mercury.*

HYDROCELE.—Dropsy of the serous membrane in which the testicle is partially enveloped. It comes on very slowly, generally taking many months to fill the sac, and showing itself first at the bottom of the scrotum. It may readily be distinguished from rupture by its great transparency if a candle is held behind it in a dark room, when it looks very like an egg covered with the branches of vessels, whereas a rupture is seldom nearly so transparent. The latter also may be known from hydrocele by the impulse given to it on coughing. See *Rupture*, 426. Hydrocele is not attended with danger of any kind, and is seldom painful except from its weight; but when the swelling reaches a great size, as it often does, it leads to great inconvenience, and the patient is anxious to get rid of it by any means in his power. To effect this, an operation called "tapping" is performed, by which the fluid is drawn off, and afterwards inflammation is often purposely established in the interior of the sac, in the hope of causing its two surfaces to adhere, and thus prevent a return of the fluid. It is, however, rather a dangerous operation, on account of the extent of the inflammation which sometimes occurs; and it should on no account be performed by any one but the experienced surgeon.

HYDROCEPHALUS (*Water in the Brain*), Symptoms of acute, 121; chronic, 122; causes of, 123.

HYDROCEPHALUS, Treatment of acute, 320; treatment of chronic, 321.

HYDROCHLORIC ACID (*Muriatic acid*), 223; diluted, *ib.*; symptoms of poisoning by, 171; treatment of, 507.

HYDROCYANIC ACID, Diluted, (*Prussic acid*), medical properties and use, 223; symptoms of poisoning by, 175; treatment of poisoning by, 510.

HYDROGEN.—One of the gases still considered simple, because hitherto chemists have not been able to decompose it. It is readily obtained from water by decomposing it, taking advantage of the strong affinity which heated iron has for the oxygen, which, with hydrogen, forms that fluid. The water has only to be passed through an iron tube heated to redness, and then the internal surface of the tube becomes oxidised, and pure hydrogen gas escapes from the other end. This gas is the lightest substance known, 100 cubic inches only weighing, under the ordinary temperature and pressure of the atmosphere, 2·14 grains. Besides water, it enters largely into the composition of the various parts of the animal machine. It also unites with carbon to form

carburetted hydrogen gas; with sulphur, to produce sulphuretted hydrogen; and with phosphorus, it combines in the shape of phosphoretted hydrogen.

HYDROPATHIC COMPRESSES and BATHS.—See *Hydropathy*, 202, 207.

HYDROPATHY, Nature of, 201; modes of action of, *ib.*; necessity for dieting and exercise in combination with, 202; processes used in, 202, 207; advantages and disadvantages of, 207; precautions necessary to be taken during its employment, 208.

HYDROPHOBIA, Symptoms of, in man, 129; in the dog, 130; treatment of, 466.

HYDROTHORAX (*Water in the Chest*), 80. See also *Dropsy*.

HYGEINE, Medical.—The science which treats of the preservation of health by other means than the employment of medicines. See Part I., chaps. 2 and 3; also the articles *Drainage*, *Air*, *Water*, *Ventilation*, *Climate*, *Food*, *Management of the Sick-room*, &c.

HYOSCYAMUS (*Henbane*), Extract of, 233; tincture of, 245; treatment of poisoning by, 511.

HYPERTROPHY.—Excessive growth of a part without alteration of structure. Thus the heart may become hypertrophied, 145; or the breasts, or the tonsils, 453.

HYPOCHONDRIASIS, (*a form of dyspepsia*); symptoms of, 152 (*par.* 416); treatment of, 482 (*par.* 1436).

HYPOCHONDRIAC REGION.—See *Abdomen*.

HYPOGASTRIC REGION.—See *Abdomen*.

HYSTERIA, Nature of, 148; symptoms of, *ib.*; treatment of, 481, 482.

HYSTERICAL DIATHESIS, Nature of, 148; symptoms of, *ib.*; treatment of, 481.

HYSTERICAL PAROXYSM, or *Hysterics*, symptoms of, 149; diagnosis from epilepsy, 150; treatment of, 481.

HYSTERICAL SIMULATIONS, Detection of, 150; treatment of, 482.

HYSTERICAL PUERPERAL CONVULSIONS, Treatment of, 505.

HYSTERICS.—See *Hysterical Paroxysm*.

ICE is employed in medicine and surgery to reduce the temperature and contract the vessels both of the exterior and interior of the body. When applied externally, it should be pounded and mixed with water contained in a bladder, by which means the temperature will be maintained at 32° F.; whereas unthawed ice may be much lower than that degree, when it would do harm rather than good. The remedy is a very powerful one, and should seldom be adopted without the supervision of a person of some experience, as it is easy to destroy life by means of extreme cold to the head or stomach when the powers are at a low ebb. In acute inflammation of the brain, and in the active stages of fever, ice to the head will be borne for hours together; but the moment that the circulation becomes languid, the greatest care is necessary, lest congestion should be produced. So also in using ice internally, very small portions should be swallowed at one time, but they should be often repeated, so as to keep the temperature down, but not so low as to stop the circulation, and produce harm rather than good. It is a well-known fact, that the presence of ever so small a piece of ice in water, if continued for more than a few minutes, reduces its temperature to 32°; and as that is quite low enough for all the purposes to which ice is applied, it is the most prudent plan to use as little ice in the water as will remain in that condition, renewing it as it is dissolved, by the addition of small quantities from time to time.

ICES, and *iced drinks*, should be taken with great caution by those whose constitutions are at all delicate, as they are apt to produce mischief, especially if taken when the body is fatigued; but *immediately* after violent exercise, as for instance, dancing in a warm room, they may be swallowed with comparative impunity.

ICELAND MOSS, 234; decoction of, 262.

ICHOR.—A peculiar kind of semi-purulent discharge, somewhat more thin and watery than good *pus*, and often stained with blood.

ICHOROUS.—Partaking of the nature of *ichor*.

ICHTHYOSIS (*fish-skin*) is not amenable to any ordinary treatment.

ICHTHYOSIS, Nature of, 71.

ICTERUS.—*Jaundice*, which see.

IDIOPATHIC (*self-produced*). — The term is applied to diseases which are not the result of others pre-existing in the system, in which latter case the second disease is said to be *symptomatic* or *traumatic*.

IDIOSYNCRACY, Definition of, 3.

ILIAC PASSION.—A synonym for colic when attacking the portion of intestine called the *ileum*.

IMPERIAL, 250; effervescent, *ib.*

IMPETIGO (*crusted tetter*), Symptoms of, 69; treatment of, 388.

INCONTINENCE OF URINE, 107; treatment of, 451.

INCUBUS.—See *Nightmare* and *Sleep*.

INDIAN HEMP (*cannabis Indica*), is grown in India, Persia, and Africa, where, though otherwise resembling the common hemp, it throws out a secretion of resin, in which the peculiar properties appear to reside. Both the dried plant (called in India *gunjah*), and the resin (called *churrus*) are employed in medicine. *Gunjah* is sold in bundles, which consist of the stems, leaves, and flowers glued together by the resin which exudes. They are of a dusky green colour, and have an agreeable narcotic odour and a bitter taste. *Churrus* is a hard resin of a blackish grey colour, a fragrant and narcotic odour, and a bitterish, acrid taste. The leaves and capsules without the stalks are sold in India under the names of "bang," "subjee," or "sidhee." The medicinal properties of Indian hemp are due to the resin, which has the power of producing intoxication, and is used for that purpose throughout India and Africa. The action is decidedly narcotic, the stage of stimulation being soon followed by a sedative effect; and it is strongly recommended in neuralgia and other diseases of the nervous system. But it appears to be very uncertain in its action in this country, probably owing to the adulterations or defects in the preparations used. It is employed in the shape of a purified extract, of which the dose is from half a grain gradually increased to three or four grains, though one grain is usually sufficient in India. A tincture is also made by digesting half an ounce of the extract in half a pint of proof spirit, the dose of which is twenty to forty minims; but the resin not being soluble in water, it is precipitated by its addition, and is not, therefore, a convenient form of giving the medicine.

INDIGESTION (*Dyspepsia*), Varieties and symptoms of, 154 *et seq.*; treatment of, 483, 484.

INFANTILE THERAPEUTICS, 268, 271.

INFANT, Management of the healthy, during the first month, 271 *et seq.*—as the sleeping place, 272; clothing, *ib.*; wet and dry nursing, 274; washing, 275; air and exercise, *ib.*; crying of, 276.

INFANT, Treatment of the accidents and diseases incidental to new-born, 276 *et seq.*—as rate of mortality, 276; still-born, 277; injuries during birth, *ib.*; malformations, *ib.*; blue disease, 278; rupture, *ib.*; tongue-tied, *ib.*; mother's marks, *ib.*; nine-day fits, *ib.*; erysipelas and erythema, *ib.*; purulent ophthalmia, 279; red-gum, *ib.*; yellow-gum, *ib.*; skin-bound, *ib*; abscesses, *ib.*; swelled breasts, *ib.*; derangement of the bowels, 280; convulsions, *ib.*

INFANT, Treatment of, in health and disease, from the end of the month to the end of the second year, 281 *et seq.*—as washing and dressing, 281; feeding, *ib.*; weaning, 282; articles of food for, 283, 284; air and exercise, 285; sleep required for, *ib.*; diseases connected with dentition, 285, 287; effects of careless weaning, 287.

INFECTION.—See *Contagion*.

INFLAMMATION, Theory and definition of, 41; symptoms of, 42.

effects of, *ib.*; seats of, 43; degree of activity in, 44; sympathetic fever accompanying, *ib.*; of the mucous membranes, 47 *et seq.*; of the skin, 57 *et seq.*; of the cellular membrane, 74 *et seq.*; of the serous membranes, 77 *et seq.*; of fibrous and muscular tissues, 85 *et seq.*; of the bones, 92 *et seq.*; of the glands, 99 *et seq.*; of the brain, 115 *et seq.*; of the spinal cord, 127, 128; of the nerves, 128 *et seq.*

INFLAMMATION, General treatment of, in the child, 302; in the adult, 364, 367; of the effects of, 367, 369; of the sympathetic fever accompanying, 369.

INFLAMMATIONS, Treatment of special, in the child, 303 *et seq.*—as catarrh and influenza, 303; acute bronchitis, *ib.*; chronic bronchitis, *ib.*; hooping-cough, 304; croup, *ib.*; spasmodic croup, 305; gastritis, *ib.*; diarrhœa and dysentery, 306; discharges from the vagina, *ib.*; inflammations of the skin, 307, 314; pneumonia, 315; peritonitis, *ib.*; colicky pains, 316; hiccup, *ib.*; hydrocephalus, 320, 322.

INFLAMMATIONS, Treatment of special, in the adult, 370 *et seq.*—as catarrh and influenza, 370; laryngitis, 371, 372; bronchitis, 373, 375; gastritis, 376; diarrhœa, 376, 377; dysentery, 378; English cholera, *ib.*; Asiatic cholera, 378, 379; inflammation of the bladder, 380; of the urethra, *ib.*; leucorrhœa, or *whites*, *ib.*; skin diseases, 381, 392; chronic ulcers, 392, 394; wounds of the skin, 395, 400; burns and scalds, 400, 403; œdematous inflammation, 404; phlegmonous, 405; gangrene, 406; pneumonia, 407; pleurisy, 409, 410; serous pericarditis, *ib.*; peritonitis, 411; enteritis, 412; inflammation of synovial capsules, 412, 413; gout, 413; rheumatism, 415, 416; muscular spasms, 417; strains, sprains, and dislocations, 418 *et seq.*; rupture and prolapse, 426 *et seq.*; inflammation of bones, 429; treatment of fractures, 431, 440; hepatitis, 442, 443; inflammation of the kidneys and bladder, 445, 452; of the parotid gland, 452; tonsils, 453; thyroid body, 454; testicle, *ib.*; absorbents and their glands, 455; of the brain, 461; of the nerves, 465.

INFLUENZA, Symptoms of, 47, 48; treatment of, in children, 303; in the adult, 371.

INFUSION, Nature of, 234; various kinds of, *ib.*; as infusion of buchu, *ib.*; of calumba, 235; cascarilla, *ib.*; chamomile, *ib.*; cloves, *ib.*; gentian (*compound*), *ib.*; horse-radish (*compound*), *ib.*; linseed (*compound*), *ib.*; orange peel (*compound*), *ib.*; quassia, *ib.*; rhubarb, *ib.*; roses (*compound*), *ib.*; senna (*compound*), 236; valerian, *ib.*

INHALATION.—The drawing into the lungs of vapours of various kinds. These may be simple warm water, which is then inhaled in the form of steam, or water medicated with various volatile substances, such as poppy-heads, or hops, or other anodynes; or iodine or mercury rendered volatile by heat; or chloroform or ether in vapour, in order to produce a cessation from pain (*anæsthesia*) during operations, or with a view to relieve spasms or sickness. The only kinds of inhalation which are safe enough for domestic use are those in which hot water, or medicated infusions or decoctions, are employed. These are very innocent, and in slight cases of *laryngitis* and *bronchitis*, or in sore-throat, will often afford relief. A common pint basin with a tin funnel inverted over it, and filled with the hot water or decoction, answers every purpose; and if the pipe of the funnel is put into the mouth, and the breathing is carried on through it for a few minutes, the gorged vessels are relaxed, and very often they are stimulated to carry on the circulation with increased rapidity and efficiency. In quinsy it is an excellent mode of hastening the formation of matter, and in many other congestions and slight inflammations about the throat, the plan may be adopted with great advantage. Three or four poppy-heads and a handful of marsh-mallows, boiled in a quart of water for an hour and strained, make an excellent liquid for the purpose of inhalation.

INJECTION—(see *Enema* when intended for the bowels).—Injections are also used for the *urethra*, and into *fistulas*, which see.

INOCULATION.—See *Small-pox* and *Cow-pox*.

INSANITY (*Mania*), Symptoms of, 151; treatment of, 482.

INSPIRATION.—The act of drawing in breath, as *expiration* is that of forcing it out; the two together making up respiration.

INSTRUMENTS useful for *Domestic Surgery*.—In this country, where the aid of a surgeon can always be obtained, the only instruments which can be required are a pair of dressing-forceps, an enema-syringe, an ear-syringe, and perhaps a common lancet, and a gum-lancet, in case of their being wanted for the use of a surgeon who may be without his instruments. But for emigrants, a longer list is desirable, as there is no knowing what it may be necessary to attempt in the absence of all surgical aid. The list for emigrants, therefore, should comprise the following:—1st, a pocket-case containing a pair of common lancets, a gum-lancet, a pair of dressing-forceps, tenaculum, probe-pointed scissors, caustic-case, and a knife with one common scalpel blade, and one longer blade called a bistoury. Besides these, he should take a stomach-pump, which will also act as an enema-syringe; a four-ounce ear-syringe, a tourniquet, some curved needles for sewing up wounds, a seton-needle, a supply of silk for ligatures, &c., and a small set of tooth instruments, consisting of five or six pairs of forceps, one adapted to each kind of tooth (see *Tooth-drawing*, 261). A cupping-case and a set of catheters will make the set more complete; but if they are added, the proprietor should obtain some practical instruction in their mode of use. Besides instruments, it will be advisable to take a good supply of bandages, some flannel adapted to that purpose, a piece of spongiopiline, and some thin gutta-percha in sheets.

INTEMPERANCE. — See *Drunkenness*.

INTERMENT, Premature. — See *Death, Signs of.*

INTERMITTENT FEVER, Symptoms of, 27; causes of, 28; treatment of, 356.

INTESTINES.—See *Alimentary Canal.*

INTESTINES, Bleeding from the, 146; treatment of bleeding from the, 479.

INTOXICATION.—See *Drunkenness.*

INVALID-TAP, Description of, 249.

INVALID DIET AND DRINKS, 17, 246, 249.

INVERSION OF THE WOMB.—A dreadful accident that sometimes, but very rarely, happens in labour, from the womb being completely turned inside out. If such a fearful complication should occur in the absence of medical assistance, the only thing to be done is to press it back again by force, fixing the ends of the fingers upon the most prominent point, and steadily, but firmly, restoring it to its natural position if possible.

INUNCTION.—The rubbing in of an ointment or greasy substance with a view to the absorption of its component parts.

IODINE, Medical properties of, 236; tincture of, 245.

IODIDE OF ARSENIC is a combination of iodine with arsenic, and is used in certain skin diseases; but it does not appear to possess any greater virtues than the *liquor arsenicalis.*

IODIDE OF IRON.—A combination of iodine and iron, generally met with in small crystalline masses of an iron-grey colour, with a metallic lustre, and a styptic taste. It is a good tonic in scrofula, as well as in anœmia and chlorosis, the dose being from two to five grains; but as it is very deliquescent, it is generally made into a syrup. See *Syrup of Iodide of Iron*, 244.

IODIDE OF LEAD.—A preparation of iodine and lead, which is used in some skin diseases, externally applied. For porrigo it is a good change

when the iodide of mercury fails. The ointment for this purpose is made by mixing one drachm of finely powdered iodide of lead with seven drachms of lard or white wax ointment.

IODIDE OF MERCURY.—See *Mercury, Iodide of,* 238; *Ointment of Iodide of Mercury,* 239; and the *Treatment of Porrigo,* 313.

IODIDE OF POTASSIUM. — See *Potassium, Iodide of,* 241.

IODIDE OF SULPHUR is used in skin diseases with good effect in the form of ointment, which is made by mixing half a drachm of the iodide with an ounce of lard. It is chiefly useful in *porrigo, lupus,* and *lepra.*

IPECACUANHA, Medical properties of, 236; compound powder of, 242; wine of, 245.

IRIS.—See *Eye, Anatomy of the.*

IRIS, Symptoms of inflammation of the, 163; treatment of, 490.

IRON, Medical properties of, 236; compound mixture of, 239; pill of, with myrrh, 240; sulphate of, 244; wine of, 246.

IRRIGATION as a method of treating inflammation and wounds of the skin, 265.

IRRITABILITY in physiology is applied to a property inherent in muscular fibre, by which it is enabled to contract on the application of stimuli, which may be that of the nervous fluid, or of some other more tangible means, such as simple contact with a rough or pointed body, or the galvanic fluid, or with some acid or caustic. It appears to be a vital endowment belonging to muscles in virtue of their structure.

IRRITABILITY is a term, in medicine, applied to the condition of the nervous system, in which the most trifling causes produce distress. It is met with as a symptom of general debility, or of dyspepsia, especially in that form where the liver is inactive.

IRRITATION.—A term used rather loosely in medicine to signify the earliest stages of congestion and inflammation, 44.

ISINGLASS (see *Gelatine*), as suited for infants, 284.

ISLE OF WIGHT.—This island, so well known to tourists, is a favourite resort of those invalids whose lungs are delicate, and especially in the winter season, when the climate of its sheltered parts is exceedingly mild. See *Climate.*

ISSUES, Use and method of inserting, 263.

ITCH (*Scabies,* or *psora*), Symptoms of, 64; seat of, *ib.*; diagnosis of, 65; treatment of, in children, 312.

ITCH, Washerwoman's, Symptoms of, 64; treatment of, 385.

ITCH, Grocer's, Symptoms of, 64; treatment of, 385.

JALAP, Root of, 236.

JAMES' POWDER (*Compound powder of antimony*), 242.—A secret nostrum, under the name of the true James' powder, is sold, which is certainly more powerful and of greater efficacy than the above preparation, though this is intended to imitate it as closely as possible.

JAUNDICE, Nature and symptoms of, 101, 102; treatment of, in children, 318; in adults, 444, 445.

JAW, Symptoms of rheumatic inflammation of the, 166; treatment of, 492; treatment of dislocation of the, 425; of fractures of the, 440.

JAWS, Anatomy of the.—See *Skeleton.*

JEJUNUM.—A part of the small intestines. See *Alimentary Canal.*

JELLIES, Suitable for invalids, 247 *et seq.*

JOINTS, Anatomy of the.—Every joint throughout the body is composed of two or more bones, whose ends, where they come in contact, are covered with a smooth layer of cartilage. Between the edges of this layer in each bone is stretched loosely in most cases a fibrous covering, or capsule as it is termed, which again, as well as the cartilage, is lined by a serous membrane which secretes a thin fluid (the *synovia*) intended to lubricate the joint, and popularly called from that circumstance "joint-oil." In addition to this provision for maintaining free motion, there are also a number of strong fibrous bands called "liga-

ments," which are stretched from one bone to the other, and prevent dislocations. When great violence is used, they are often strained or ruptured, constituting the accident known as a "sprain" or "strain." But besides the joint in which there is free motion, and which is termed in anatomy *diarthrosis*, there are also two other kinds known as *amphiarthrosis* and *synarthrosis*. The former of these is the species of union between two bones, in which they are attached by an elastic portion of cartilage, without any capsule or synovia, as is seen in the bones of the vertebræ and the cartilaginous union between the bones of the pelvis. The latter comprehends the varieties of union known as *suture* in the skull, and as *gomphosis* in the case of the attachment between the teeth and their sockets. But in ordinary language, these are not known as joints, that term being confined to the kind called *diarthrosis*, which, again, is subdivided into three other forms known as (*a*) arthrodial, (*b*) hinge-like, and (*c*) ball-and-socket joints.

(*a*) *Arthrodial joints* are those in which the motion is in all directions, but limited in extent, such as those of the carpal and tarsal bones, the articular processes of the vertebræ, the radius with the ulna, and the tibia with the fibula.

(*b*) *The hinge-like joint* is one in which the movement is free, but in one direction only, as in the elbow, wrist, knee, ankle, lower-jaw, fingers, and toes. There is a synovial capsule, and there are always strong lateral ligaments with weak fibres before and behind.

(*c*) *The ball-and-socket joint* is only found in the hip and shoulder. It has a circular form with a bag of ligamentous fibres lined with synovial membrane.

(*d*) *The motions* in joints may be referred to four heads—viz., gliding, angular movements, circumduction, and rotation. *Gliding* exists to a considerable extent in all joints, and is merely the movement of one bone upon the other. *Angular movements* are made in four different directions, either backwards, forwards, outwards, or inwards. *Circumduction* is most remarkable in the hip and shoulder joints; it consists in the slight degree of motion which exists in the joint, while the limb is made to describe a circle round it. *Rotation* is the movement of a bone upon its own axis, and is illustrated in the hip and shoulder.

(*e*) *The structures* entering into the composition of joint, are bone, cartilage, fibrous tissue, fat, and synovial membrane. The cartilage forms a thin layer either on the ends of the bones or between them (*interarticular*), with synovial membrane interposed, or without this, and then called *interosseous*.

JOINTS, Symptoms of acute inflammation of the synovial capsules of, 84; chronic inflammation of the synovial capsules, 85; acute articular rheumatism, 89; chronic articular rheumatism, 90; scrofulous disease of the, 138.

JOINTS, Treatment of scrofulous diseases of the, in children, 326; acute inflammation of the synovial capsules of, 412; chronic inflammation of the synovial capsules of, *ib.*; purulent matter effused in, 413; of cuts and other wounds of joints, *ib.*; of acute articular rheumatism, 415; chronic rheumatism, 416; treatment of sprains, 419; dislocations, 419 *et seq.*

JUGULAR VEINS.—The blood is returned to the heart from the head and face by two principal veins on each side the neck, called the external and internal jugular veins. The internal jugular lies close to the carotid artery deeply in the neck; but the external jugular is only covered by skin, fat, a very thin layer of *fascia*, and by the thin layer of muscle which covers the whole side of the neck, and is called *platysma myoides*. This vein is sometimes opened in children for the purpose of obtaining blood; but it is by no means a safe operation, and should not be attempted by any one but the regular surgeon.

JULEP.—The old name for camphor mixture, and some other similar preparations.

JUNIPER.—The tops, the fruit, and the volatile oil of the fruit, of the *juniperus communis*, are used in medicine, having a stimulating diuretic effect, but too strong for those cases where there is much disease of the kidneys. Juniper enters into the composition of gin and hollands, by which they are rendered diuretic. It is also used as the compound spirit of juniper, which is made as follows:—"Take of juniper berries bruised, eight ounces; caraway seed and fennel seed bruised, of each one ounce; proof-spirit, half a gallon; water, one pint. Macerate the seeds and the berries in the spirit for twenty-four hours; then add the water, and with a slow fire distil off half a gallon."—*Dublin Pharmacopœia. Dose*, two to four drachms. (*Very similar in its effects to gin.*)

KALI.—The old name for *Potass.*

KIDNEYS, Anatomy of, 95; symptoms of inflammation of the, 102; of Bright's disease, 103; gravel and stone, *ib.*; bloody urine, 105; suppression of urine, 106; retention of urine, *ib.*

KIDNEYS, Treatment of congestion of the, in children, 318; treatment of, when affected as a sequel to scarlet fever, 319.

KIDNEYS, Treatment of simple inflammation of, 445; of Bright's disease, or granular degeneration of, 447; gravel and stone, 447 *et seq.*; bloody urine, 449; suppression of urine, 450; strangury, *ib.*; retention of urine, *ib.*; incontinence of urine, 451; limpid diabetes, *ib.*; diabetes mellitus, 452; hemorrhage from, 480.

KINESIPATHY, Nature and objects of, 209; practical application of, 211; probable powers of, 213.

KING'S EVIL.—A name formerly given to open scrofulous sores, from the belief that they were capable of cure by the touch of the king's hand.

KING'S YELLOW.—A sulphuret of arsenic, now almost superseded by chrome yellow for painting purposes, but still occasionally used for killing flies. In cases of poisoning by it, the treatment is the same as for *arsenic*, 508.

KINO.—The concrete exudation from *pterocarpus erinaceus*, imported in the form of small angular fragments or tears, of the size of a pea or less, void of odour, but with an intensely astringent taste; it contains 74 per cent. of tannin, is sparingly soluble in water, but readily dissolves in alcohol. It is an admirable astringent, and is used either in the form of powder, of which ten grains are the dose, or as a tincture, which is given in the dose of one or two drachms.

KNEE-JOINT.—This joint is constituted by the femur or thigh-bone above, by the tibia below, by the patella or knee-cap in front, by the two semi-lunar cartilages within, and by the several ligaments and synovial membrane and capsule as usual in all hinge-joints (see *Joints*). It is a very large, strong, and important joint, and is liable to severe inflammations, corresponding with its extent.

KNEE-JOINT, Treatment of scrofulous disease of the, 326; of rheumatism of the, 415; of the dislocations of, 424.

KNEE-CAP, Treatment of fracture of the, 438.

LABOUR, Management of, 497 *et seq.*—as the qualities of the monthly nurse, 497; complications occurring in, 498; directions for management of natural, 498, 499; assistance required in unnatural, 499, 500; management after delivery, 501, 504; treatment of the diseases which follow, 504 *et seq.*—as abscess of the breasts, 504; sore nipples, *ib.*; irritable state of nervous system, 505; puerperal convulsions, *ib.*; mania, 506; fever, *ib.*; white leg, or *phlegmasia dolens*, *ib.*

LABURNUM SEEDS, Symptoms of poisoning by, 177; treatment of, 511.

LACERATED WOUNDS, Treatment of, 397.

LACTATION, Establishment of, 502 *et seq.*; symptoms of milk fever, 169.

LACTEALS.—See *Absorbents.*

LACTUCA VIROSA (*the common Lettuce*), Extract of, 234.

LAMENESS is the defective action of one or both legs, and may arise from one or other of the following causes, viz., rheumatic inflammation of either of the joints of the limb, or rheumatism of the muscles, or from scrofulous disease of the hip, knee, or ankle, or from dislocation of any of the joints or fracture of the bones, or from debility, or paralysis, or lastly, from natural deformity.—See *each of the above subjects.*

LANCET.—See *Bleeding*, 256.

LARD, 236.

LARYNX, the organ of voice situated at the top of the wind-pipe (*trachea*), and corresponding with the position of the part called "Adam's apple" in the male sex, which is produced by the projection of its thyroid cartilage. It is a short tube of an hour-glass form, and is composed of various cartilages (*a*), ligaments (*b*), muscles (*c*), vessels and nerves (*d*), and a lining mucous membrane (*e*).

(*a*) *The cartilages* are six in number, and consist of the following, some of which are single, and the others in pairs:—

1. One thyroid (*fig.* 1, *a*, *b*, *c*).
2. Two cricoid (*fig.* 1, *e*).
3. Two arytenoid (*fig.* 1, *d*).
4. Two cornicula (*fig.* 1, *f*).
5. Two cuneiform (*fig.* 1, *g*).
6. One epiglottis (*fig.* 1, *h*).

The *thyroid cartilage* is the largest of the larynx. It consists of two lateral portions, or *alæ*, (*fig.* 1, *a*), which meet at an angle in front and form the projection known as "Adam's Apple" (see *a*). After puberty in the male, this projects at an acute angle; while before that time, in the male, and in the female at all ages, it is obtuse. Each *ala* is nearly square, having at its back two horns, one projecting upwards (the *superior cornu*, *fig.* 1, *h*), and the other downwards (the *inferior cornu*, *c*). In the angle formed by the meeting of the two *alæ*, and upon its inner side near the lower border, are attached the epiglottis (*fig.* 1, *h*), the vocal cords, and the thyro-arytenoid and thyro-epiglottidean muscles. The *cricoid cartilage* is a ring narrow in front and broad behind (see *fig.* 1, *c*), where it has two rounded surfaces, upon which lie the arytenoid cartilages. On each side of the ring is a cavity which gives attachment to the thyroid cartilage by means of its inferior cornu. The *arytenoid cartilages*, two in number, are triangular in form (see *fig.* 1, *d*), broad below and pointed above, and prolonged by two small fibro-cartilages which receive the name of *cornicula* (*f*). *The cuneiform cartilages* are two small cylinders, enlarged at each extremity, and attached to the middle of the external surface of the arytenoid (see *fig.* 1, *g*). Lastly, the *epiglottis* is placed immediately in front of the opening of the larynx, which it closes completely when the larynx is drawn up beneath the base of the tongue in the act of swallowing.

(*b*) *The ligaments* of the larynx are very numerous, consisting of those which unite the thyroid cartilage with the *os hyoides* (or bone of the tongue, *fig.* 1, *i*), of those which connect it with the cricoid, of the ligaments of the arytenoid cartilages, and of those of the epiglottis. They are too numerous to describe minutely here, with the exception of those belonging to the arytenoid cartilages, which are eight in number, and upon which the organ of voice mainly depends. Four of these are the capsular ligaments and posterior bands, which protect the joints between the arytenoid and cricoid cartilages; but besides these there are a pair of *superior thyro-arytenoid ligaments* (or false vocal cords), which consist of two thin bands of yellow elastic tissue, attached in front to the internal angle of the thyroid cartilage, and behind to the inner and anterior edge of each arytenoid cartilage (see *fig.* 1, *o*); also

Fig 4

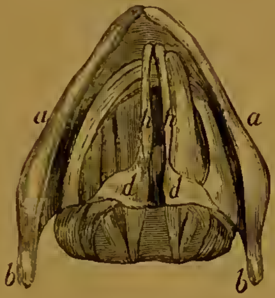


Fig 1.

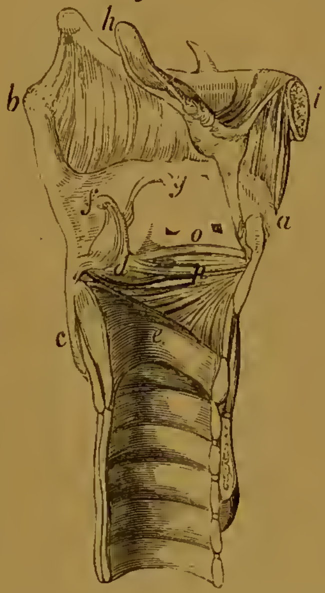


Fig 3.

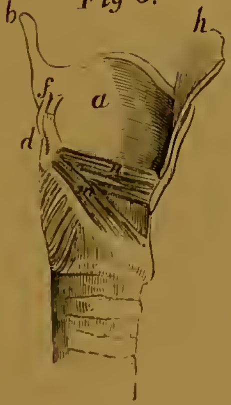
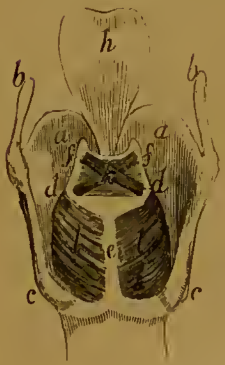


Fig 2.



DIAGRAMS OF THE LARYNX.

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a pair of *inferior thyro-arytenoid ligaments* (or true *vocal cords*), which are thicker than the superior, and like them composed of yellow elastic tissue. Each is attached in front to the angle of the thyroid cartilage, and behind to the anterior angle of the base of the arytenoid (see *fig.* 1, *p*). The space between these two ligaments *on each side* is formed into a pouch, which is called the ventricle of the larynx, while the slit between the two true vocal cords is termed the *glottis* or *rima glottidis.* These parts are shewn from above in *fig.* 4, from which the mucous membrane is removed to shew the ligaments and muscles and the thyroid cartilage (*a a*), with its superior cornua (*b b*). The arytenoid cartilages are indicated by (*d d*), and the vocal cords by (*p p*), with the *rima glottidis* between them.

(*c*) *The muscles* of the larynx are eight in number; five being concerned in the larynx itself, as the organ of voice, and three in moving the epiglottis. The first five consist of the following, named from their attachments:—

1. The crico-thyroideus.
2. Crico-arytenoideus posticus (*fig.* 2, *l*).
3. Crico-arytenoideus lateralis (*fig.* 3, *m*).
4. Thyro-arytenoideus (*fig.* 3, *n*).
5. Arytenoideus (*fig.* 2, *k*).

The *crico-thyroid* muscle is stretched between the anterior surface of the cricoid cartilage and the lower and inner border of the ala of the thyroid. The *crico-arytenoideus posticus* is attached to the posterior surface of the cricoid cartilage and to the outer angle of the base of the arytenoid cartilage (see *fig.* 2, *l*). The *crico-arytenoideus lateralis* is attached to the upper border of the side of the cricoid cartilage, and to the outer angle of the base of the arytenoid cartilage (see *fig.* 3, *m*). The *thyro-arytenoideus* is attached to the angle of the thyroid cartilage, and to the base and outer surfaces of the arytenoid cartilage (see *fig.* 3, *n*). Lastly, the *arytenoideus* occupies the space between and behind the arytenoid cartilages, between which it is stretched. It consists of transverse and oblique fibres (see *fig.* 2, *k*). The *three muscles of the epiglottis* consist of scattered fibres which are attached to it, and have the power of raising or depressing it, but have little connection with the organ of voice. With regard to the five muscles of the larynx itself described above, they all appear to close the opening called the *rima glottidis*, except the crico-arytenoidei postici, which open it. The crico-thyroidei are tensors of the *vocal cords*, and these muscles, according to Mr. Bishop, who is the best authority on the subject, are said to regulate the tension, position, and vibrating length of the vocal cords.

(*d*) *Of the vessels and nerves*, the arteries are derived from the adjacent superior and inferior thyroid branches of the external carotid. The nerves are the superior laryngeal and recurrent laryngeal, both branches of the pneumogastric, and derived from the brain itself, or from that part called *medulla oblongata.*

(*e*) *The mucous membrane* is so arranged as to cover somewhat loosely all the parts already described. The superior aperture of the larynx is a triangular or heart-shaped opening, broad in front and narrow behind. This is bounded anteriorly by the epiglottis, posteriorly by the arytenoideus muscle, and on either side by a fold of mucous membrane stretched between the epiglottis and the apex of the arytenoid cartilage. Below this is the cavity of the larynx, which is divided into two parts by an oblong constriction, produced by the prominence of the true *vocal cords.* That portion which lies above them is broad and triangular above, but narrow below; while that which is below them is narrow above, and broad and cylindrical below, the circumference of the cylinder corresponding with the ring of the cricoid cartilage. The form of the *glottis* is that of an isosceles triangle, bounded on the sides by the vocal cords, and behind by the *arytenoideus* muscle. Its length is greater in the male than in the female, measuring somewhat less than an inch in the former.

(*f*) *For the use and action* of these various parts, see *Voice.*

LARYNGEAL CONGESTION AND INFLAMMATION, 48.

LARYNGITIS, Symptoms of acute, 51; of chronic, *ib.*; treatment of acute, 371; of chronic, 372.

LAUDANUM (*tincture of opium*), 245; poisoning by, see *Opium.*

LAUGHTER, when involuntary and not caused by healthy emotions of the mind, is either symptomatic of hysteria, 149; or it is connected with some obscure chronic disease of the brain, of which a sardonic kind of laugh is sometimes the first sign.

LAUREL-LEAVES (procured from the common laurel tree), when scalded. are sometimes used to make a sedative poultice for the purpose of allaying neuralgia, for which they are well calculated. They should be employed in a considerable mass, taking care to bruise them, after soaking them for some minutes in boiling water. Laurel-leaves contain a principle resembling prussic or hydrocyanic acid, and, therefore, they should be used with great caution in cookery; while laurel-water is capable of being employed as a poison, and if so, the individual should be treated as described under *Prussic Acid*, 510.

LAVEMENT.—See *Enema.*

LAVENDER, Compound tincture of, 245.

LAXATIVES (*mild aperients*).—See *Cathartics*, 191, 346, 347.

LEAD.—This well-known metal in its pure state is insoluble and harmless, but many of its salts are used in medicine, and are capable of acting as poisons; while in small doses they are readily taken into the system from water when dissolved in it (see *Water*), or from some of our common drinks, such as cyder or perry, &c. The symptoms are detailed under the head of *Poisoning by Lead*, 173, 174.

LEAD, Plaster of, 241; liquor of acetate of, 237; iodide of, see *Iodide of Lead.*

LEAD, Acetate of, or *Sugar of Lead*, is used for various purposes in medicine, being one of the most active astringents we have. It should always be given with the addition of a few drops of vinegar to each grain, in order to prevent its conversion into the carbonate, which is a violent poison. The dose of the acetate is from one to three grains, generally united with opium, to prevent its causing colic; but it should never be used in domestic medicine without urgent necessity.

LEAD, Symptoms of poisoning by, 173, 174; treatment of, 509.

LEAMINGTON.—A midland watering-place, containing a saline or mineral spring which has obtained considerable celebrity during the present century. It is used for very similar purposes to those for which Cheltenham is famous. See *Climate.*

LEECHES, Use and mode of applying, 258, 259; method of stopping bleeding from the bites, 259; followed by œdematous swelling, 260; by erysipelas, *ib.*

LEEK.—See *Vegetables.*

LEG.—The part between the knee and the ankle.

LEG, Treatment of fractures of the, 436, 437; treatment of *white leg*, 506.

LEMON.—See *Fruit.*

LEMON, Peel, juice, and essence of, 236.

LEMON WHEY, Preparation of, 250.

LEMONADE, Preparation of, 249; concentrated, 250.

LENITIVE ELECTUARY, or *Confection of Senna*, 231.

LENS, Crystalline.—See *Eye, Anatomy of the.*

LEPROSY (*lepra*), Symptoms of, 71; treatment of, 389.

LETHARGY. — Synonymous with *Drowsiness*, which see.

LETTUCE (see *Lactuca Virosa*), Extract of, 233.

LEUCORRHŒA (*whites*), Symptoms of, 56; treatment of, 380.

LICE.—Mode of destroying those infesting the head, 487; those infesting the body, *ib.*

LICHEN (*an Eruption of the Skin*), Symptoms of, 70; treatment of, 389.

LIGAMENTS, Structure of, 85; inflammation of, 86; treatment of rheumatic inflammation of, 415, 417; treatment of sprains of, 419.

LIGHT.—Importance of that from the sun, 9; artificial light, *ib.*

LIGHTNING sometimes causes death from the passage of the electric fluid through the body; or in slighter cases it may only stun the individual for a few seconds or minutes. In such cases a stimulant should as soon as possible be poured into the stomach, and the same remedies applied as are recommended for *Drowning*, 512. As the electric fluid generally is attracted by trees, church-towers, and steeples, or other high objects, the safe plan is to avoid such situations during a thunder-storm, and to incur a wetting rather than seek shelter under them.

LIMBS, Cramps in the.—These are symptoms of approaching collapse when they occur in severe dysentery or cholera. When they attack the patient without such complication, they merely indicate a feeble circulation, and a tendency to congestion in the muscles affected.

LIMBS, General pains in the.—This symptom generally precedes the attacks of all kinds of fever, including influenza, ephemeral fever, typhus fever, rheumatic fever, &c., &c.

LIMBS, Twitching of the.—This occurs in the last stages of typhus fever, in the form known as *subsultus tendinum;* also in other fevers when they assume a fatal form, and in many other dangerous diseases, such as *delirium tremens, inflammation of the brain, hydrocephalus*, &c. In young children, they often accompany trifling derangements of the stomach, and are then said by nurses to be caused by "wind."

LIME exists in most cases in the form of carbonate, which, when burnt in a kiln, is deprived of its carbonic acid, and is then an oxide of calcium, or an union of oxygen with a metallic base known by that name. Combined with phosphoric acid it enters into the composition of our bones as phosphate of lime, and this material is therefore largely required for the human framework, for which purpose it is chiefly supplied by the bread we eat, as well as in the form of carbonate and muriate of lime by the water we drink. See *Water*.

LIME WATER is a solution of caustic lime (or oxide of calcium) in water, and is a useful anti-acid in those forms of dyspepsia which are characterized by great irritability of the stomach with excessive secretion of acid and development of gas. According to the *London Pharmacopœia*, it is made as follows: "Lime, half a pound; distilled water, twelve pints. Upon the lime, first slaked with a little of the water, pour the remainder of the water and shake them together, then immediately cover the vessel and set it by for three hours; afterwards keep the solution with the remaining lime in stopped glass vessels, and when it is to be used take from the clear solution." When exposed to the air it becomes converted into a carbonate.

LIME, Carbonate of (*prepared chalk*), which is a purified carbonate of lime, is used extensively in medicine for several purposes. See *Chalk, prepared*, 228; *powder of chalk with opium*, 242; *chalk mixture*, 239.

LINCTUS.—A syrupy form of medicine only used for *cough.*

LINEN, Method of changing in severe disease, 337; importance of clean, in contagious diseases. See *Contagion.*

LINIMENT, or *Embrocation*, Nature of, 236; formulas for various, 236, 237—as liniment of ammonia, *ib.*; of camphor, 237; compound, of camphor, *ib.*; of opium, *ib.*; of soap, *ib.*; of turpentine, *ib.*; various kinds of, described as embrocations, 349; mode of using with spongio-piline, *ib.*

LINSEED.—The seed of the common flax (*linum usitatissimum*). The seed itself is used for making linseed-tea, and when ground it becomes linseed-meal, which is employed for making poultices.

LINSEED-TEA, or *Compound Infusion of Linseed*, 235.

LINSEED POULTICE, Method of making, 242, 264.

LINT, 264.

LIPS.—The edges of the mouth, so called.

LIPS, Blueness of.—A symptom of congestion of the lungs, or the last stages of any disease of those organs; also of apoplexy and suffocation, from whatever cause it arises.

LIPS, Paleness of.—When permanent, a symptom of anœmia and chlorosis; also of fainting, when temporary.

LIPS, Treatment of cracked and chapped, 403; breaking out of, see *Herpes*.

LIQUID FOOD, required, 15 *et seq.*—as simply diluent, 15; nourishing, 16; stimulating, *ib.*; conservative, *ib.*

LIQUOR.—A medical solution kept ready for use.

LIQUORS, Various, 237—as liquor of acetate of ammonia, *ib.*; of acetate of lead, *ib.*; of potass, *ib.*

LIQUORS, Fermented. See *Fermented Liquors*.

LIQUORICE (the fresh root of the *glycirrhiza glabra*), is used in medicine, and called *stick-liquorice*, as well as the extract, which is known as *liquorice* or *pipe-liquorice*. The root is imported in large quantities from Spain (hence its name *Spanish liquorice*), where it is dug up when three years old, washed, and the small fibres cut off; but the English is considered to be the best. It may be kept fresh by covering it with sand in a damp cellar. The root is emollient and demulcent, and is employed in the form of extract or decoction in coughs or catarrhs, also to flavour or mollify other medicines. The powder is used to prevent pills adhering. The extract is familiar to every one.

LITHARGE, (*Fused Protoxide of Lead.*)—Only used in medicine to make the lead-plaster.

LITHOTOMY and LITHOTRITY.—See *Stone in the Bladder*, 449.

LIVER, Structure of, 95; symptoms of congestion of, 99; of inflammation of, 99, 100; of chronic disorders of the, 156.

LIVER, Treatment of congestion of the, in children, 316, 317; treatment of congestion in adults, 441; of inflammation of the, 442, 443; of torpidity of the, 485; of active congestion of the, with excess of bile, *ib.*

LIVER SPOTS, 390.

LOBELIA INFLATA (*Indian tobacco*).—A native of the United States, where it is a common weed. Its odour is faint, and the taste at first insipid, but when chewed, acrid and resembling tobacco. In small doses it is a valuable sedative expectorant, allaying spasm, and therefore useful in asthma and spasmodic cough, as well as in chronic bronchitis. It is generally employed in the form of tincture, which is made as follows:—"Dried lobelia in powder, five ounces; proof spirit, two pints; macerate for fourteen days, then strain, express, and filter." The dose is from twenty to forty minims.

LOBSTER (see *Fish*), Treatment of poisoning from stale, 510.

LOCHIA, Importance of watching, 505.

LOGWOOD (the wood of *hæmatoxylon*) is a powerful astringent, and is used in the form of *decoction* made as follows:—"Logwood in small chips, one ounce; water, half a pint. Boil for ten minutes in a covered vessel, and strain."

LOCK-JAW (*a form of tetanus*), Symptoms of, 129; treatment of, 466.

LONGING.—The morbid appetite which occurs in pregnancy is so called. No harm usually follows its indulgence, even if the article desired is of the most indigestible kind.

LOOSENESS OF THE BOWELS.—See *Diarrhœa*.

LOSS OF BLOOD.—See *Hæmorrhage*.

LOTIONS are watery solutions of various kinds, used for the purpose of applying medicines to the skin when inflamed or ulcerated. See *Treatment of Inflammations of the*

Skin, and *Sprains* and *Strains;* also *Ulcers.*

LOW DIET includes what are called "slops" only, with a small allowance of bread and butter.

LOZENGE.—A dried preparation of sugar in small shapes, either circular or oval. Various kinds are made for coughs, generally compounded of ipecacuanha or antimony, with opium or morphine. That known as "Locock's Pulmonic Wafer" is made of ipecacuanha and morphine, and is very useful in many kinds of cough.

LUMBAGO.—Rheumatism of the muscles of the loins, 90; treatment of, 416.

LUMBAR.—Of or relating to the loins.

LUMBAR ABSCESS, Symptoms of, 139; treatment of, 327.

LUMBRICI.—See *Worms.*

LUNACY.—See *Mania.*

LUNAR CAUSTIC (*nitrate of silver*). See *Caustics.*

LUNGS.—These double organs are contained within the chest, and are each of a conical shape, embracing the heart between them, and separated from each other by a membranous partition called *mediastinum.* On the exterior they are convex, and correspond with the internal surfaces of the chest; internally they are concave, to receive the heart (see *Diagram of the Heart*, 625). Above they end in a conical point, which extends a little above the first rib; and below they are broad and slightly concave, resting upon the diaphragm, and extending much farther down behind than before. Their colour is pinkish grey, mottled with black. In weight, when healthy, they are together about forty ounces, and each is divided into two lobes by a fissure; whilo on the right side, the upper lobo is again subdivided, so that it is often said to have three lobes. Tho right lung is somewhat larger and heavier than the left, and is shorter from the great convexity of the liver. The lungs are free in the chest, except at the root, where they are attached to the spine, or rather to the *mediastinum*, by the pulmonary arteries and veins, as well as by the bronchial tubes on each side. On all other parts, the lung is covered by a serous membrane (the *pleura*) which also lines the chest. The substance of the lung is composed of the branches of the bronchial tubes, which terminate in air-cells; also of the arteries and veins, lymphatics and nerves, all of which are held together by areolar or cellular tissue, constituting what is called the *parenchyma* of the lungs. Thus the lungs are mado of three distinct tissues, besides the component vessels and nerves, viz.—1st, the serous covering or *pleura*; 2nd, the *parenchyma*, or cellular, or areolar tissue; and 3rd, of the mucous lining of the air-passages and cells. The bronchial tubes terminate in one large bronchus on each side, and then again unite to form the trachea or windpipe, which has tho *larynx* at the top (see *Larynx.*) Thus the lungs, together with the chest which contains them, may be considered as an organ intended for the double purpose of purifying the blood, and of forming the voice, by producing *at will* a current of air through the larynx.

LUNGS, Inflammation of the.—When the lungs are attacked by inflammation, it becomes important to ascertain which of the above structures composing them is the seat of the disease. It is, therefore, necessary to examine into the symptoms of pleurisy, 79; pneumonia, 76; bronchitis, 48; and phthisis, 135; when by comparing them, it is tolerably easy to ascertain which is the prevailing form of inflammation. In practice, it is found that pleurisy and pneumonia generally co-exist to some extent, and the term pleuro-pneumonia, 79 (*par.* 239), is employed to designate tho disease. Pneumonia is also usually more or less complicated with bronchitis; but still it exists in a distinct form, which may be distinguished from genuine bronchitis by tho symptoms given at 77. The following table shews the prevailing symptoms of each form:—

Pleurisy.	Pneumonia.	Bronchitis.
Cough slight, short, dry, and painful, with little or no expectoration, and no wheezing or crackling sound. A dry grating sound heard in the chest in the early stages, and pain felt on tapping the spaces between the ribs with the fingers. Sound of respiration audible in the early stage, with resonance of the chest, but after effusion the reverse is the case.	Cough short and painful, but not incessant. Expectoration rusty-coloured and stringy, seldom frothy. A crackling sound heard in the chest, which sounds dull on percussion. Pain increased on taking a full inspiration. Breath feels hotter than natural. Wings of the nostrils in the child observed to work; great anxiety of countenance in severe cases.	Cough incessant, but not attended with pain, except from muscular soreness. Expectoration frothy and white, or yellowish. Wheezing and bubbling sounds heard in the chest, which is resonant on percussion. No pain on a full inspiration.

LUNGS, Treatment of inflammation of the, in the child, 302 *et seq.*—as bronchitis, 303; hooping-cough, 304; croup, *ib.*; spasmodic croup, 305; pneumonia and pleurisy, 315.

LUNGS, Symptoms of congestion of the, 76 (*par.* 229); treatment of, 406.

LUNGS, Treatment of inflammation of the, in the adult, 371 *et seq.*—as laryngitis, 371; bronchitis, 373, 374; pneumonia, 407; pneumonia, with typhus fever, small-pox, or measles, 408; combined with bronchitis, *ib.*; pleuro-pneumonia, *ib.*; chronic-pneumonia, *ib.*; pleurisy, 409, 410; pleurodynia, 410; tubercular consumption, 470, 472.

LUXATION.—A synonym for *Dislocation.*

LYMPH.—The fluid contained within the lymphatic absorbents (see *Absorbents*); also, the fluid which exudes from the skin in vesicular eruptions, such as cow-pox, eczema, &c.

LYMPHATICS.—See *Absorbents.*

LUPUS, or *Noli-me-tangere*, also called *Corroding Tetter*, Symptoms of, 72; treatment of, 390.

LYING-IN ROOM, Management of, 497, 502.

MADEIRA.—An island in the Atlantic much resorted to by consumptive patients. See *Climate.*

MADEIRA.—A wine imported from the island of that name. See *Wines.*

MADNESS.—See *Mania.*

MADNESS, Canine. — See *Hydrophobia.*

MAGNESIA, Carbonate of, 237; sulphate of, *ib.*; fluid, 268.

MAGNETISM, Animal.—See *Mesmerism.*

MALARIA, or *Marsh Miasma.*—See *Causes of Ague*, 28.

MALE FERN.—Used as a worm medicine, 331.

MALFORMATIONS in New-born Infants, 277. See also *Deformities*, 327, 428, 429.

MALIGNANT DISEASES, Symptoms of, 161; treatment of, 487.

MALT-LIQUORS are brewed from *malt* and *hops*, together with *sugar* and *water* only, according to law, with the addition of *isinglass* to refine them; but to these, it appears, there are surreptitiously added by the retailers, in many cases, *salt*, *tobacco*, *treacle or liquorice*, *cocculus Indicus*, *capsicum*, *sulphate of iron*, and *quassia*, or other cheap bitters, together with certain spices for the purpose of adding to the flavour. These are used in brewing *stout* and *porter*, and also enter into the composition of *ale* and *beer*, in all their multifarious forms known as *Burton ale*, *Scotch ale*, *Kennett ale*, *pale ale*, *bitter beer*, *India pale ale*, and last and least, *table-ale* and *table-beer*, sometimes called *small-beer.*

(*a*) *Malt* consists of grain in which the starch has been converted into sugar by permitting the germinating process to go on to a certain point, and then putting an end to it by heat. It may be made from barley, wheat, oats, rye, or maize; but the first of these is almost always selected for the purpose. The operation of malting is conducted by steeping the barley in water until the grains become swollen and soft, and then piling it in a heap called a *couch*, to favour the development of heat caused by the absorption of oxygen from the air. After this the grain is spread more or less according to the weather, so as to keep the heat at the proper standard throughout (*flooring*). During this process, the barley throws out a rootlet and a germ, and at the same time the peculiar chemical substance called *diastase* is developed, which has the property of converting starch into dextrin, and afterwards into grape-sugar. When the germination has proceeded far enough, the vitality of the seed is destroyed by kiln-drying, and according to the heat employed the malt will be *pale*, *amber*, or *brown*, or, in some cases, *black*. In malt of these different shades, the saccharine matter is found to be in the greatest perfection in the pale malt, which consequently produces the strongest and best beer; amber malt being only slightly scorched, its sugar is very nearly as well developed as in the pale; but in brown malt the scorching has proceeded so far as to diminish the sweetness considerably, and in the black variety it is lost in the bitter taste of the caramel, into which the sugar is converted. In its conversion into malt, barley loses *weight*, but gains in *bulk*; so that 100 lbs. of barley produce but 92 lbs. of malt, while 100 bushels of the former are converted into 108 bushels of malt.

(*b*) *Hops* are the flowers of the hop plant, which is extensively cultivated in Kent, Sussex, Worcestershire, and Herefordshire, as well as in Belgium and the United States, from which countries they are now imported, when bad seasons raise the price high enough in England to warrant the venture. The Sussex and Mid-Kent hops are the strongest and most highly-flavoured; while the Worcestershire hops, including those of Herefordshire, which are all classed as such, are of more delicate flavour, peculiarly adapted for the brewing of the pale ale so much in fashion at present. Hops are gathered by hand in September and the early part of October, and rapidly kiln-dried; after which they are closely packed in "pockets" or "bags," and become a solid mass, of a bright or greenish yellow colour, with a fine dust permeating it, in which the principal flavouring matter resides. When rubbed in the hand they feel sticky, and leave a yellow powdery stain, with a powerful and peculiar odour. In selecting hops, much depends upon the use for which they are intended. If for pale ale or table-beer, new hops of a pale yellow colour, and mild but fine flavour, should be chosen; and for strong ales, porter, or stout, the strongest and most aromatic hops of the south district are to be preferred; but here, also, new hops are always more profitable than old ones. Hops one year old have not lost much of their strength; but after that age, every successive year takes away from the flavour and strength; after three or four years the hop is comparatively worthless. The active principle resides in a bitter resinous matter, denominated *lupulin*, and also in an essential oil, both of which appear to act on the nervous system of the human being, and also upon the beer itself by preventing decomposition.

(*c*) *Water*, called by the brewers *liquor*, is the next essential material to produce beer, and upon its quality will depend, in a great measure, that of the malt-liquor of which it forms a part. Burton ale and beer have always been celebrated; and it appears that this well-deserved character depends mainly upon the quality of the water, which contains an unusually large proportion of sulphate of lime, together with carbonate and muriate of lime. It is well known that these salts exert a considerable depurative power on vegetable juices, as in the manufacture of cane-sugar, &c.; and in brewing, they supersede the necessity for "finings," the ale brewed with this water becoming clear and bright almost directly. The greater part of the lime is precipitated in combination with the mucilaginous matters, and hence the water, as it exists in the beer, is much more soft than in its natural state. Thames water also appears to make good beer; but it requires a considerable quantity of "finings," as it is comparatively deficient in sulphate of lime. For this reason rain-water, though more capable of extracting the virtues of the malt and hops than river or spring water, is not so well suited either to make it fine, or to keep it from being converted into vinegar.

(*d*) *Yeast* is alluded to under the article *Fermentation*, as essential to the production of the alcoholic fermentation. It may at any time be made from nitrogenized materials, without the intervention or use of any particle of its own nature, usually called a *ferment*; but this latter method is generally adopted. As yeast is employed for fermenting wort, so in the same way, when it is wanted for that purpose, the surplus yeast is had recourse to from one brewing to another; and, as it is very important to use none but that obtained from a good brewing, it is imperative that great caution should be exercised in its selection, inasmuch as in this case, as in many others throughout nature, "like produces like." The best yeast for working beer (called "pitching the tun") is that which is thrown out of the bung-holes of the casks into what are called the stillions, to be presently described. In summer it should not be more than two or three days old; but in winter, it will keep for a week or even a fortnight, though it always loses strength by keeping. It should be kept in a cool place, in cold water, which should be changed every second day. The kind of yeast necessary for setting to work any particular kind of malt liquor is of some importance, as it appears that it should, if possible, be obtained from a similar parent stock to that for which it is intended. Yeast from strong ale works more slowly, but at the same time more strongly, than that from small beer; so that, when the latter is required to go through its fermentation quickly, it will not do to have recourse to yeast from ale, in order to set it going.

(*e*) *Isinglass* for refining beer is of the coarsest description. See *Gelatine*.

(*f*) *Brewing* is conducted upon certain *principles*, which, in *practice*, are modified to suit particular circumstances, as, for instance, whether *porter*, *ale*, or *small beer* is to be brewed. The first step is to heat a quantity of liquor sufficient to *mash* the malt to be brewed, at an average temperature of 170 degrees Fahrenheit. The accommodation in the copper is seldom sufficient to effect this in one bulk, and, therefore, the water in it is raised to the boiling point, and then reduced to the proper temperature by mixing it with cold water; and in proportion to the temperature of this last, which will be affected by the state of the weather, must the quantity of it be increased or diminished. For this purpose, it is sufficient to know that one part of cold to three of boiling water is the average in weather fit for brewing, which is not favourably conducted either in very hot or very cold seasons. For the sake of economy, the malt is generally mashed twice or thrice, so as to leave no soluble matter behind, and also to give full time for the conversion of the starch into sugar, which is not completed until the access of hot water. A first mash, therefore, is usually made, with just enough water to cover the malt, and at a temperature generally of about 168 degrees, using about eight gallons of water to a bushel of malt. This quantity of water is poured into the mash-tub, and after being carefully raised or lowered to the required degree, the malt is shaken in, taking care to separate it well, so as to prevent its clotting together. When the malt and water are thoroughly stirred together, the temperature ought to be again taken; and if it is below 150 degrees Fahrenheit, the next mash must be raised two or three degrees accordingly. The whole is now to be covered over with sacks, so as to keep in the heat as much as possible, and should thus remain for about one hour and a half, or rather less in very cold weather. As soon as the brewer has covered his mash-tub, he begins to charge his copper again for the next mash, having a full hour for the purpose. At the end of the time above-named, the brewer, having a sufficient quantity of hot water ready for the next mash, proceeds to draw off the first by turning the tap in the mash-tun to run in a small stream, and carefully returning to the grains a gallon or so till it runs fine. This first mash seldom runs off more than half the quantity of wort which was added as liquor, and if the brewing is to be all "one way," or "entire," more liquor is at once added before all of this has run off; but when, as in many private families, two kinds of beer are to be brewed, the wort from each mash must be kept apart. But as the above proportion of malt to liquor would turn out the ale of a very strong nature indeed, it is usual to "sparge" the grains during the time that the first wort is running off, until a sufficient quantity has been collected. Thus, supposing it is intended to brew ale of ten bushels of malt to the fifty-four gallons, then, as the ten bushels have been mashed in eighty gallons of liquor, and as half this will be retained by the grains, twenty-four gallons more of hot liquor must be poured on the malt before the fifty-four gallons will make their appearance in the under-back; and, as the liquor would run through the malt if poured on carelessly from a bucket, it is usual to pour it on from a watering-pot, or some similar vessel, so as to ensure its thoroughly washing it as it passes through. As soon as the wort is thus obtained, it is at once ladled or pumped into the copper; and after being well mixed with the hops, it must be raised to the boiling point as quickly as possible, when the fire must be raked or regulated so as to keep it at a *low* boiling temperature for the proper time. The quantity of hops per bushel of malt varies according to the taste of the neighbourhood, the strength of the ale or beer, and the age of the hops. For strong ale intended to be kept, a pound a bushel is about the average, and for table-ale, from half a pound to three-quarters, the latter quantity being required when the brewing is at or near the summer time, or where a bitter beer is preferred. When what is called "bitter-beer" is required, nearly double the quantity of hops must be used; and if they are of the Worcester growth, the flavour will still more nearly approach the original Burton. The proper time for the boiling to be maintained may be known by the wort "breaking up" into flakes—that is, the mass of fluid, which at first is uniformly dense in appearance, becomes converted into a flaky liquid, part bright, and the remainder in small flattened granules; and when this is the case, the boiling is carried far enough, and the wort must be strained from the hops into *the cooler*. The first wort requires much less boiling than the second, the average being generally about an hour and a half; while for the second mash, two hours or two and a half will not often be too long; and for a third, three hours at least must be the period adopted. The hops, when strained, are returned into the copper for the next boiling, as some little soluble matter still remains; but to these a second quantity must be added for the boiling of the second mash. The wort when hopped is next cooled with as much speed as possible, and hence it should not be more than three or four inches deep in the cooler, except in very cold weather. When a refrigerator is used, it must not be set in action until the wort is somewhat reduced in temperature; but as soon as it has fallen to about 140 degrees, begin and cool it as quickly as can be effected by these means, until the wort is down to about 50 degrees, after which it is at once removed to the fermenting tun. Lastly, the fermentation is effected by the addition of yeast. See *Fermented Liquors.*

(*g*) The varieties of malt liquors are as follows:—*Strong Ale* is brewed from eight to ten bushels of malt, and eight or ten pounds of hops; pale malt here, again, is the best, but this is a matter of taste depending upon the colour preferred. *Bitter Ale* is generally brewed from very pale malt, the quantity of which is from four to five bushels, and of hops eight pounds to the hogshead. *Table Ale or Beer* is usually made from the second mash of strong ale; but when this is not the case, it requires about four or five bushels of malt, and from four to seven pounds of hops, to fifty-four gallons of water. Very small, or harvest beer, is sometimes brewed with two or three bushels of malt and four pounds of hops, but this will not keep more than a week or ten days. Pale malt is the best for this beer, unless a high colour is required. *A hogshead of Stout* is brewed from one quarter of pale malt, two bushels of brown malt, and three quarters of a bushel of black or patent malt mixed together, and hopped with eight pounds of hops. *Porter* is often the second mashing of malt for stout, with the addition of treacle; thus, from the above brewing of stout, with the addition of eighteen pounds of treacle, thirty-six gallons of porter may be brewed. Or, if porter is to be brewed at once from the malt, then called "entire," half the quantity ordered for stout will be required. Extract of liquorice is said to be used instead of treacle, and certainly the taste of porter bears out the popular belief, but it has not been detected in it by microscopical examination.

(*h*) *Malt liquors of all kinds are much improved in flavour and briskness by bottling*, if this plan is adopted at the proper time. Very often when a barrel of any kind of this beverage is almost sour, it is made up with a little additional sugar, and bottled with the expectation that it will turn out well. But the fact is, that it ought not *quite* to have completed its fermentation when it is bottled, or at all events its saccharine matter should still be unconverted into alcohol or vinegar. Beer should never be bottled while there is any tendency to spirt from the vent-peg; but as soon as this has ceased, and it is fine, it may be bottled with advantage. If there is any doubt about its being fit, the corks may be left out for a day or two, and on being driven in they will generally require the aid of a string or wire to keep them down, and then with a strong bottle there is every chance of avoiding a failure from either extreme. When beer is somewhat too flat, a tea-spoonful of sugar, or a raisin or two, or a few grains of rice, will afford new *pabulum* for fermentation, and set the carbonic acid free, as is desired for this purpose.

(*i*) *The wholesomeness* of genuine malt liquors is admitted by all but the advocates of total abstinence from all fermented liquors. Bitter beer as sold by the Burton brewers, especially by Messrs. Allsopp and Bass & Co., appears to be a pure and wholesome beverage, well adapted for the invalid, being concocted of malt, hops, and water only, the proportion of hops being greater than usual, so that it is stomachic and somewhat sedative. Stout is a very strong and stimulating drink, and is generally selected as a cordial in the recovery from serious and debilitating illnesses, such as fevers, &c.; but it is often too heady for those unaccustomed to its use. Fresh table-beer is an admirable kind of beverage for general use with the mid-day meals in this climate. Strong ale is very strengthening, but is only fit for occasional use, and for those who are recovering from recent illness. Ale and table-beer, when brewed at home, are certain of being free from adulteration, and on that account are to be preferred; but they are apt to be "hard" or sour, when they are unfit for delicate stomachs.

MAMMA (see *Breast*). See also milk-fever, 169; establishment of lactation, 502; diet during lactation, 503; abscess of the, 504; treatment of the, *ib.*; management of the, after labour, 502, 504.

MANIA, Symptoms of, 151; treatment of, 482.

MANNA, 237; an excellent aperient for babies, 468.

MARASMUS (*atrophy*), symptoms of, 137, 138; treatment of, 325, 326.

MARMALADE.—A wholesome preserve of Seville and sweet oranges mixed, well adapted for the diet of healthy children.

MARROW.—The fatty matter contained within the shafts of the long bones. It is considered a delicacy as an article of food, and also enters into the composition of several *toilet articles*.

MARSH-MALLOWS, 238.

MASTICATION.—The division of the food by the teeth. See *Digestion*, 153, 154.

MATICO. — The leaves of *artanthe elongata* which yield their active principles to water and alcohol. They are of great utility as a styptic and astringent (see treatment of hemorrhage, 479, 480). The leaves are either used as imported, being simply scalded and applied in that condition; or when used internally, the tincture, which is made as follows, is employed: — Take of matico leaves, in coarse powder, eight ounces; proof spirit, two pints; macerate for fourteen days, strain, express, and filter. Dose, one to two drachms.

MATTER.—See *Pus*.

MAW-WORM.—See *Short Thread-worm*, 157.

MEALS suited to the Nursery, 294.

MEASLES (*rubeola*), Symptoms of, 38; treatment of, in the child, 300; in the adult, 361.

MEASURES used in Pharmacy, 220.

MEAT, Butcher's.—This kind of food in Great Britain is confined to beef, mutton, lamb, veal, and pork—the qualities of which, in reference to the stomach of the invalid, vary very considerably.

(*a*) *In choosing beef*, the hand and the eye are both called into play; for not only must the colour and general appearance be in conformity with established rules, but it must feel tender to the touch. Old and hard beef feels elastic when pressed by the finger, while young and tender meat gives way, and *retains the impression of the finger* after it is removed. Beef, when first cut through, ought to present a bluish-red colour, which should rapidly become almost a crimson red on exposure to the air. The grain should be smooth, fine, and transparent-looking, with an intermixture of fat in the rump, sirloin, and ribs. The fat should be firm and white; the deeper the yellow the more oil-cake has been employed in producing the fat, and the worse will the flavour be. Cow-beef is closer in the grain than that of the ox, and the fat generally more white; in the cow there will always be the udder to mark the sex, or at all events the fat is arranged differently in that region, being more broken up into nodules than in the ox, which presents a large *roll* of fat on each side. Bull-beef is usually more dark and blue than either that of the ox or cow; it is also, when of more than two years of age, hard and tough, and unfit for ordinary kitchen use. The age of the animal may always be known if the head is visible, by counting the rings upon the horns, one of which is added for each year of its life. Fresh beef of good quality is well suited to most stomachs, if not very delicate; but it should be roasted or boiled with great care, in order to agree with the dyspeptic invalid. Beef-tea is of the greatest service in the sick-room, and may be made from the inferior parts, as free from fat as possible.

(*b*) *Mutton* is the great resource of weak stomachs, and is eaten either roast or boiled, or in chops broiled or toasted. There is a great variety in this kind of meat, depending upon the age and breed; but the best test after all is the flavour when it comes to the table, together with the quantity and depth of colour of the gravy. Young and ill-fed mutton gapes on cutting it, and is tasteless and spongy, and the gravy scanty, pale, and watery.

(*c*) *With regard to lamb*, there is as great a difference here in the various breeds as in beef and mutton; but to most people lamb is lamb, let the quality be good, bad, or indifferent. The *Dorsetshire lambs* are the earliest, next to *house lamb*, which is capable of being produced at Christmas, the warmth of the kitchen enabling the rearer to shelter the lamb at any season. These early lambs are very delicate in flavour, and fetch high prices in London and elsewhere; and up to the time of Easter, whenever that may be, the fore-quarter generally fetches nearly double the price of beef or mutton. Grass lamb lasts from March till August. When not too young and fat, it is a very wholesome kind of meat for weak stomachs, and being more tender than mutton is peculiarly adapted for chops.

(*d*) *Veal* can scarcely be considered as a meat fit for any but the strongest stomach, as it is apt to disagree with all others. For the purpose of making broth, it is however well adapted, excepting in the summer months, when it soon turns sour. Calves produce veal in nearly, but not quite, as great variety as bullocks and sheep do beef and mutton; but, in respect to veal, the alteration is more in reference to the diet and management than to the breed. Nevertheless, this last influence is very great, and the difference between an Alderney calf and that of a Hereford is very considerable, though here also the milk of the former, being much richer and more plentiful, may in some measure account for the difference. Large quantities of veal are brought up to London by the railways, and some from Belgium by the steamers. The greater part of this is small and devoid of fat, but of good flavour nevertheless. The prime veal of the London market is supplied from the adjoining counties, where the fattening of them is carried on by men who buy up the calves from the dairy districts, and bring them up by cows which are able to suckle another in addition to their own. At the age of ten or eleven weeks, these calves weigh nearly 20 stone, and in some counties the calves are not killed till they are still larger, while in Dorsetshire they are rarely suffered to live more than three weeks, the cow-calves being invariably saved there to be reared as milkers. *In choosing veal*, select that of which the kidney is well covered with thick *solid* and white fat. The whitest meat is not always the best flavoured, being made so by bleeding and improper feeding, with that object in view. The cow-calf is preferred when it can be obtained; and it may be known by the udder on the fillet. The bull-calf makes darker and harder veal. Veal, like lamb, requires to be quite fresh, which is shown by the blue or red colour of the veins inside the shoulder. The flesh should be dry, and not flabby, and the kidney-fat should be free from smell.

(*e*) *Pork* is even less digestible than veal to the weak stomach, though it is not a little remarkable that a strong hearty man will digest it more rapidly than any other meat. It is, therefore, more with reference to the *preservation* of health than to its *restoration* that we must consider this kind of food. Pigs are sold by the ordinary butcher, as well as the pork butcher, at such a variety of ages that their flesh cannot so completely be identified by the age as the animals we have hitherto considered. It first makes its appearance on the table at five or six weeks old, when it is called a *sucking-pig;* after this the animal is respited until it is ten weeks or three months of age, from which time up to six or eight months it comes into the market as *pork*. Then, again, it waits until a year old or more, when it is killed for *bacon-meat* or *hams.* Both pork and bacon-meat vary in quality greatly; breed and feeding being the chief elements in the difference. Dairy-fed pork holds the highest place in public estimation, which it richly deserves when the pig is of a good sort; but this does not always happen. Farmers' pigs, though dairy-fed, are not always confined to that diet; for they are made the scavengers of the farm, and are allowed to fill themselves upon any filth or carrion that happens to be within their reach. Pigs fed like those of the butchers are hard and devoid of fat, and, unless they are finished with meal and potatoes, they are not to be considered of superior quality. None are better than the pigs fed on the refuse of the mill and starch-factories, where thousands are fattened every year. Bacon-meat may easily be too fat for common use, and the size best adapted for this purpose ranges from ten to fifteen score, with a moderate thickness of fat. For the agricultural labourer bacon can scarcely be too thick in fat, because he uses it as a relish to his bread and potatoes; but this is not the case in the housekeeping of the middle classes, and for them a medium degree is far the most economical and agreeable to the palate.

MEAT, Symptoms of poisoning by fresh, 175; treatment of, 510.

MECONIUM.—The first discharge from the bowels of a new-born child, of a dark olive-green colour, 271.

MEDICINE.—A term applied to the healing art, and especially to that part of it which treats of internal diseases.

MEDICINES, Aims of, 178; various theories of, 185 *et seq.*

MEDICINES.—Those vegetable and mineral substances, not being food, which are used either externally or internally for promoting health or removing disease:—as those which are used for promoting health, 17; list of, suited to domestic use, 222 *et seq.*; list of, suited to children, 268 *et seq.*; formulas for various, 341 *et passim.*

MEDICINE CHEST.—Those who are about to emigrate, and those who are located in this country in such retired situations as to be unable to obtain drugs at short notice, are compelled to lay in a stock of them, and to keep what is commonly called a medicine chest. When these drugs can be readily renewed, as small a stock as possible should be kept, as most of them soon spoil by keeping. A complete medicine chest suited for emigration will include all the articles which are enumerated at 219, 246; excluding, of course, those which are made extemporaneously, such as the infusions and decoctions. But for smaller medicine chests, such as are suited for this country, the following list may suffice, added to the utensils enumerated at 221:—

Acacia Gum in powder, ℥iv.
Aloes, Compound pill of, ℥ss.
Alum, ℥iv.
Ammonia, Sesquicarbonate of, ℥ss.
  „ Muriate of, ℥iv.
Antimony, Potassio-tartrate of, ʒss.
Antimonial Powder, ʒj.
Arnica, Tincture of, ℥j.
Bismuth, Trisnitrate of, ʒij.
Borax in powder, ℥ss.
Camphor Mixture, Oj.
Castor-oil, Oj.
Chalk, Prepared, ℥iv.
Chloride of Zinc or Lime, in solution, or in substance.
Cinchona, Comp. tincture of, ℥iv.
Confection, Aromatic, ℥j.
Copper, Sulphate of, a piece of, pointed for use.
Cotton Wadding, lbj.
Cream of Tartar, ℥viij.
Creasote, ʒj.
Dill-water, ℥viij.
Ether, Sulphuric, ℥ij.
Extract of Henbane, ʒj.
  „ Dandelion, ʒij.
  „ Sarsaparilla liquid, ℥vj.
Iodide of Potassium, ʒij.
Liniment of Camphor (comp.), ℥iv.
  „ Soap, ℥viij.
  „ Turpentine, ℥iv.

Linseed-meal, lb iv.
Liquor of Acetate of ammonia, ℥viij.
,, Acetate of lead, ℥ij.
,, Potass, ℥j.
Magnesia, Carbonate of, ℥j.
,, Sulphate of, lb j.
Manna, ℥j.
Mercury, Chloride of, ʒj.
Mercury-with-Chalk, ʒij.
Mint-water, Oj.
Myrrh, Powdered, ℥j.
Ointment of Nitric-oxide of Mercury, ℥j.
Ointment of Savine, ℥ij.
Olive-oil, ℥ij.
Opium, ʒj.
Oxymel of Squills, ℥j.
Pill of Colocynth (compound), ℥ss.
,, Iron, with myrrh, ℥ss.
,, Rhubarb (compound), ℥ss.
,, Soap (compound), ʒj.
,, Squill (compound), ʒij.
Plaster, Adhesive, a yard.
,, of Cantharides, a roll.
,, of Soap, a yard.
Potass, Bicarbonate of, ℥j.
,, Nitrate of, ℥j.
Powder of Ipecacuanha, ℥ss.
,, Ipecacuanha (comp.), ʒj.
,, Rhubarb, ℥ij.
,, Jalap, ℥j.
Quinine, Sulphate of, ℥ss.
Senna Leaves, ℥iv to ʒviij.
Silver, Nitrate of, ʒj.
Soda, Bicarbonate of, lbss.
Spirit of Ammonia (aromatic), ℥iv.
,, Nitric ether, ℥iv.
Sulphate of Iron, ʒj.
Turpentine, Spirit of, ℥iv.
Tincture of Gentian, ℥iv.
,, Camphor (comp.), ℥iv.
,, Ginger, ℥ij.
,, Henbane, ℥j.
,, Lavender (comp.), ℥j.
,, Myrrh, ℥ij.
,, Opium, ℥j to ℥ij.
,, Rhubarb (compound),
Wine of Colchicum, ℥j.
,, Ipecacuanha, ℥ij.
,, Potassio-tartrate of antimony, ℥j.
,, Iron. ℥j
Zinc, Oxide of, ℥ij.
,, Sulphate of, ℥j.

MEDULLA OBLONGATA, Structure of, 114.

MEDULLARY SARCOMA, Symptoms of, 161; treatment of, 487.

MELANOSIS, Symptoms of, 161; treatment of, 487.

MELON.—See *Fruits.*

MEMBRANES. — Expanded layers of various tissues, known as—mucous membrane, 45; cellular membrane or areolar tissue, 74; serous membrane, 77; membranes of the brain, 114; of the womb, 498.

MENORRHAGIA, Symptoms of, 146, 168; treatment of, 494.

MENTAL OCCUPATIONS, Advantages of, to health, 12, 252.

MENSTRUATION, Nature of, 167; symptoms of impeded, 168; of excessive, *ib.*; treatment of impeded, 498; of difficult or painful, 494; of excessive, *ib.*

MERCURY, Different preparations of, 238—as white precipitate, *ib.*; calomel, *ib.*; green and red iodide of, *ib.*; red precipitate, *ib.*; gray powder, *ib.*; pill of, 241; symptoms of poisoning by, 173; treatment of poisoning by, 509.

MESENTERIC GLANDS, Inflammation of the, 110; symptoms of scrofulous diseases of the, or atrophy, 137; treatment of, 325.

MESENTERY.—A broad fold of serous membrane (the *peritoneum*), which attaches the small intestines to the back of the abdomen. See *Alimentary Canal.*

MESMERISM, Nature and claims of, 215.

METACARPAL BONES, Treatment of fracture of the, 433.

METASTASIS.—A sudden shifting of inflammation from one organ to another, which occurs in rheumatism, gout, mumps, &c. See the above subjects.

MIASMA. — See *Intermittent Fever,* 28.

MIDRIFF.—See *Diaphragm.*

MILIARY FEVER, Symptoms of, 40; treatment of, 362.

MILK is an article of food, which, at all ages of life, is of great value, being absolutely necessary in some form to the rearing of the young child. It is obtained from the mother's breast, or from a substitute

for this in the shape of what is called a "wet nurse," for the support of the infant, and afterwards from the cow, or sometimes from the ass or goat. Human milk, and that of the ass, contain a large proportion of the sugar of milk and cream; while that of the cow and goat abound in curd, or *caseine*, as it is termed in chemistry. Hence, when cow's milk is substituted for that of the mother in rearing infants, it should be diluted with water and sweetened in order to make it resemble the natural food. All milk is coagulated or converted into curd and whey in the stomach as the first process towards digestion; and it also assumes this condition in any case except at a very low temperature after a short period (turning sour, as it is said to do), and part becoming a soft curd, while the remainder separates as whey or serum. A decoction of the stomach of many animals, and especially of that of the calf, produces this effect artificially and is used to make cheese with this view.

MILK, To make digestible in illness, 248.

MILK-FEVER, Nature of, 169.

MILK-TEETH, Management of, 297; decay of, 298.

MIND, Occupation and amusement of the, 12, 252.

MINERAL ELEMENTS required for the use of the body, 13, 15.

MINERAL ACIDS, List of, 223; symptoms of poisoning by, 171; treatment of, 507.

MINERAL GREEN, Symptoms of poisoning by, 174; treatment of, 509.

MINIM. — The sixtieth part of a drachm, used instead of *drop*, which is an uncertain quantity when measured by dropping a liquid from a phial; the size of the neck, the hand of the dispenser, and the density of the liquid affecting it to the extent of fifty per cent.

MINT.—Three species of mint are used in medicine, viz.—peppermint, spearmint, and pennyroyal. The first and last are simply cordial and carminative, but spearmint is also diuretic.

MISCARRIAGE, Symptoms and treatment of, 496.

MIXTURE, Nature of, 238; various kinds of, 238, 239—as mixture of acacia, 238; of almonds, *ib.*; of ammoniacum, *ib.*; of camphor, 239; of chalk, *ib.*; of guaiacum, *ib.*; compound, of iron, *ib.*

MOLES, Nature of, 73; treatment of, 390.

MONKSHOOD, Symptoms of poisoning by, 177; treatment of, 511.

MONOMANIA.—See *Mania.*

MONTHLY DISCHARGE.—See *Menstruation.*

MORPHIA.—A salt of opium. It combines with the acids to form acetate and sulphate of morphia, &c., which are sometimes used instead of opium itself, though seldom fit for domestic administration.

MORTARS.—See *Utensils for Compounding Drugs*, 221.

MORTALITY, Rate of, in infants, 276.

MORTIFICATION, or *Gangrene*, symptoms of, 76; treatment of, 406.

MOTHER'S MARKS, Treatment of, in infants, 314.

MOUTH, Diseases of the, 165; treatment of, in infants, 335; in the adult, 491.

MOVEMENTS in Kinesipathy, 210, 211.

MOXA.—A means of using counter-irritation by burning a small piece of prepared lint so near the skin as to inflame and blister it. It is not much resorted to in this country.

MUCILAGE.—See *Mixture of Acacia*, 238.

MUCOUS MEMBRANE, Structure of, 45; symptoms of inflammation and congestion of, 46 *et seq.*—as catarrh and influenza, 47; bronchitis, 48, 49; hooping-cough, 49, 50; laryngitis, 51; croup, *ib.*; gastritis, 52; diarrhœa, *ib.*; dysentery, 53; English cholera, 54; Asiatic cholera, 54, 55; inflammation of the bladder, 56; of the urethra, *ib.*; of the lining membrane of the womb, *ib.*; of the ducts of glands, 57.

MUCOUS MEMBRANES, Treatment of congestion and inflammation of, in children, 303 *et seq.*—as catarrh and influenza, 303; bronchitis, *ib.*; hooping-cough, 304; croup, *ib.*; gastritis, 305; diarrhœa and dysentery, 306; discharges from the vagina, *ib.*

MUCOUS MEMBRANES, General principles of treatment of inflammation of, in the adult, 369; effects of, and remedies for, 370; treatment of special inflammation of, 370 *et seq.*—as common catarrh, 370; influenza, 371; laryngitis, 371, 372; bronchitis, 373, 375; hooping-cough and croup, 376; gastritis, *ib.*; diarrhœa, 376, 377; dysentery, 378; English cholera, *ib.*; Asiatic cholera, 378, 379; inflammation of the bladder, 380; of the urethra, *ib.*; leucorrhœa, *ib.*

MUCUS, Nature of, 46.

MUMPS, Nature and symptoms of, 107; treatment of, in children, 319; in adults, 452.

MURIATIC ACID (*hydrochloric*), 223; Symptoms of poisoning by, 172; treatment of, 507.

MUSCLES.—These are the powers which chiefly affect the various movements taking place in the body, either of one part upon another, or of it as a whole upon the surface of the earth. These movements are sometimes produced by the simple expansion and contraction of hollow muscles, as in the heart, stomach, and intestines, or by means of the attachment of the two ends of a muscle to two separate bones with an intervening joint. All muscles have residing within them a power of contraction, either at the mandate of the will (of which the organ is the brain), or at the command of some other part of the nervous system extraneous to that body. The former set of muscles are called *voluntary*, and are those by which we walk, talk, or move our eyes, &c.; whilst the latter, called *involuntary*, are the muscles which move the food onwards in its course, or contract upon the blood in the heart or arteries, and these are entirely independent of the will. Lastly, a third set are sometimes voluntary and at others involuntary, being intended to act of themselves when not called upon by the will—these are the muscles of respiration, and those which expel the various secretions.

MUSCULAR TISSUE (*muscles*), Structure of, 85; mechanical injuries to, 87; symptoms of rheumatic inflammation of, 88; of spasm of, 90, 91; treatment of rheumatism in children, 316; in the adult, 415; of muscular spasms, 417; of strains and sprains, 418, 419; of rupture and prolapse, 426, 428.

MUSHROOMS (see *Vegetables*), Symptoms of poisoning by, 177; treatment of, 511.

MUSSELS.—See *Fish.*

MUSTARD.—The seeds of *sinapis alba* and *nigra*, whole (*mustard seed*) and ground (*flour of mustard*). Of the above plants, the former has smooth seed-vessels, and reddish or blackish-brown seeds, which are very pungent; while the latter has rough or hairy pods and yellow seeds, less pungent than those of the black mustard. The seeds are composed of cellulose matter, containing in addition a volatile and a fixed oil of mustard; also, two peculiar substances known as myronic acid and myrocene, all of which are deficient in white mustard seed. The fixed oil exists in the seed, but the volatile oil is formed in the same manner as the essential oil of bitter almonds, by the joint action of water, and a peculiar, coagulable, albuminous matter, called *myrocene*, upon a substance very imperfectly known which is termed *myronic acid.* This acid has no smell, and is not volatile, but is bitter to the taste, and contains *sulphur* and *nitrogen.* Heat coagulates myrocene, which is necessary to the formation of the essential oil, and hence mustard should always be mixed with hot water to develop its pungent powers properly. In purchasing mustard, there is no guide short of the microscope but the palate, as the full power is not developed until the flour is mixed with hot water. The adulterations are,

however, only of importance as far as the money value is concerned, as the turmeric is innocent enough of all other mischief. *Mustard seed* is sometimes used as a stomachic, and some years ago was very fashionable, but is now seldom employed for that purpose. The *flour of mustard* is the common condiment so well known, which is also used in medicine for the purpose of acting as an emetic when wanted in a hurry, 349; and for making mustard poultices, 242, 264.

MUSTARD POULTICE, 242, 264.

MUTTON.—See *Meat.*

MUTTON BROTH, Receipt for making, suited to children, 284.

MUTTON CUSTARD, for irritable bowels, 248.

MYRRH, 239; Tincture of, 245.

NAILS, Formation and structure of, 46; diseases of, 74; treatment of, 391; mode of cutting, 392.

NAPHTHA, or *Pyroxylic Spirit.*—A colourless, transparent, limpid fluid, with an ethereal and somewhat smoky odour, and an aromatic taste. It is miscible with water and alcohol. It was first introduced into medical practice by Dr. Hastings, of London, as a cure for consumption, in which, however, it has signally failed, but in some forms of bronchitis it is of great utility. The dose is from 10 to 25 minims three times a day, usually mixed with mucilage, syrup, and water.

NARCOTICS, Nature of, 190; symptoms of poisoning by, 175; treatment of poisoning by, 511.

NARCOTIC-IRRITANT POISONS, Symptoms produced by, 176; treatment of, 511.

NAUSEA.—A slight degree of sickness or tendency to vomit. See *Sickness.*

NAVEL.—The depression in the centre of the abdomen, where the navel-string is attached in the child prior to birth.

NAVEL-STRING, or *Umbilical Cord.* This is composed of arteries and veins, which convey the blood to and from the mother and child. They are slightly twisted upon each other, so as to be capable of considerable extension, without giving way. The navel-string sloughs away about five or six days after birth.

NECROSIS, Nature of, 94; treatment of, 430.

NEEDLES, when swallowed by accident, are best left to find their own way out, which they generally do in course of time. Sometimes they stick in the throat, but even then they should not be meddled with unless they are clearly within sight, when they may be seized by a pair of forceps and extracted. When a needle is broken off in the flesh, it is often a very difficult matter to extract it, unless the broken end can be made to protrude, for, by the slightest pressure the sharp point is continually pushed deeper and deeper, and often after making a considerable wound, the needle which at first was plainly felt is no longer to be discovered. The best plan in most cases is to let them alone, unless they show themselves very distinctly.

NERVES, Treatment of paralysis of, 462 *et seq.*—as paralysis of the nerve of sight, &c. (see *Diseases of the Eye, Ear, and Mouth, &c.*); paralysis of the nerves of sensation, 462; of the nerves of motion, 462, 463—as hemiplegia, 462; paraplegia, 463; paralysis of the face, *ib.*; wrist-drop, *ib.*; shaking palsy, *ib.*

NERVES, Treatment of the excitable condition of the, after delivery, 505.

NERVES, Symptoms of congestion and inflammation of, 128 *et seq.*—as neuralgia, 128; sciatica, 129; tetanus, *ib.*; hydrophobia, *ib.*; treatment of neuralgia, 465; sciatica, 466; tetanus, *ib.*; hydrophobia, *ib.*

NERVOUS SYSTEM, Structure of, 111; chemical composition of its matter, *ib.*; division of, 112; into nervous centres or ganglia, 113; the spinal cord, *ib.*; medulla oblongata, 114.

NERVOUS SYSTEM, Symptoms of diseases of—as paralysis, 124, 125; chronic diseases connected with, 147 *et seq.*—as epilepsy, 147; hysteria, 148, 149; catalepsy and trance, 150; chorea, *ib.*; mania, 151.

NERVOUS SYSTEM, Treatment of disease of, in children, 329; in the adult, 462 *et seq.*—as paralysis, 462; epilepsy, 480; hysteria, 481; catalepsy and trance, 482; chorea, *ib.*; mania, *ib.*; nervous ear-ache, 491.

NETTLE-RASH, Symptoms of, 61; treatment of, in infancy, 310; in the adult, 384.

NEURALGIA, Nature and symptoms of, 128; treatment of, 464, 466; of the teeth, 492.

NEUTRAL SALTS.—Those salts in which neither the acid nor the alkali predominates.

NIGHT-BLINDNESS.—A defect of the nerve of the eye, generally congenital, in which objects are not seen distinctly at night. If congenital, treatment is of no use; but if acquired by exposure to the rays of the sun, time and attention to the general health, with protection from the sun's rays, will often effect a cure.

NIGHTMARE.—A form of *dreams* in which there is a sensation of distress, sometimes from a weight on the chest, and at others from a feeling as if falling from a height. The cause is the same as in other *dreams*, See *Sleep*.

NIGHTSHADE, Deadly (see *Belladonna*), symptoms of poisoning by, 176; treatment of, 511.

NIPPLES (see *Mamma*) Management of, 504; sore, *ib.*

NITRATE OF MERCURY, Ointment of, 239.

NITRATE OF SILVER, 243 (see also *Caustics*); treatment of poisoning by, 509.

NITRE, or *Nitrate of Potass*, is a colourless solid salt, in striated prismatic crystals generally six-sided, semi-transparent, inodorous, with a cooling, saline, and bitter taste. In large doses of half an ounce and upwards, nitre irritates the intestinal mucous membrane, producing nausea, purging, and even death. In small doses of half a drachm to a drachm, it increases the flow of urine, and is for that reason often employed as a *diuretic*, 191, 348. It is also used as an *antiphlogistic*, 342, and especially in rheumatic inflammations.

NITRIC ACID, or *Aquafortis*, 223; symptoms of poisoning by, 172, treatment of, 507.

NITRIC ETHER, Spirit of, or *Sweet Spirits of Nitre*, 244.

NITRIC OXIDE OF MERCURY, Ointment of, 239.

NITROGEN, or *Azote*, is a gas very generally found in nature, and constitutes about four-fifths of our atmosphere. It is destitute of colour, taste, and smell; its density is 0·972. It is incapable of supporting combustion or animal respiration; but it has no positively poisonous properties. It is an important element in our food, being necessary for the formation of many substances, and especially muscular tissue. It is deficient or entirely absent in most of the vegetables in common use, but abounds in meat and bread.

NITRO-MURIATIC ACID, or *Aqua Regia.*—A compound of nitric and muriatic acids in equal measures. It is used in medicine as a stomachic and restorative, 341; and in the arts it is employed to act upon gold, which it dissolves.

NODES are enlargements of bone from inflammation of the *periosteum*, and are similar in their nature to the horses "splint." They chiefly occur in those bones which are closely beneath the skin, without any covering of muscle, as the jaw, collar-bone, and shin. They sometimes make their appearance without any impure contamination of the blood, but are generally the result of what are called "secondary symptoms."

NŒVI, or *Mother's Marks*, Treatment of, in children, 314; in the adult, 489.

NOISE IN THE EARS.—A constant sensation as if a noise was heard, generally a steady singing or throbbing. It appears to be often due to excessive sensibility of the nerves surrounding the carotid artery as it passes through the temporal bone, and is a symptom of general nervous excitability, or of determination of blood to the head, 118.

NOLI-ME-TANGERE (*Lupus, or Corroding Tetter*), 72; treatment of, 390.

NOMENCLATURE of Diseases, 19.

NOSE.—The organ of smell consists of two parts, the external or *nose proper*, and the internal or *nasal cavities*, in which resides the organ itself.

(*a*) *The nose proper* is the triangular pyramid which projects from the face above the lips. Below, it has two openings called the nostrils (*nares*) which overhang the mouth, and are so placed in order to serve as a guard upon the mouth, in reference to the articles of food which are put into it. They have a *septum* between them, and on the outer side of each is the wing (*ala*) of the nose which is a separate piece of cartilage, capable of being expanded by its particular muscle, as is seen (especially in children) in inflammation of the lungs and other conditions of those organs when the breathing is oppressed.

(*b*) *The nasal cavities* are two irregular spaces, extending from the nostrils (*anterior nares*) to the pharynx where the *posterior nares* are situated. Each of them consists of a passage separated from the mouth by the bony palate, and arbitrarily divided into three stages one above the other, called the *inferior*, *middle*, and *superior meatus*. There are several openings into these passages from extensive bony cells lined by mucous membrane, and known as the *æthmoid* and *sphenoid cells*, the *frontal sinus*, and the *antrum*; so that, altogether, the nasal cavities are connected with an extensive surface of mucous membrane, which accounts for the great secretion of mucus that is met with in inflammations of the surface. The membrane lining the whole is called pituitary or schneiderian. It is liberally supplied with blood-vessels, and has the whole of the olfactory nerve expended upon it, together with the nasal branch of the ophthalmic nerve, and some branches from Meckel's ganglion, which is one of the sympathetic system. The sense of smell is supposed to reside in the olfactory nerve, the minute branches of which terminate in the *papillæ* of the mucous membrane.

NOSE, Bleeding from the, 146; treatment of, in children, 334; in adults, 491.

NOSE, Diseases of the, 164—as foreign bodies in the, *ib.*; muco-purulent discharge from, *ib.*; polypus in, 165; treatment for removal of foreign bodies, in children, 335; of a cold in the head, *ib.*; in the adult, of eczema, 491; polypus, *ib.*; of fracture of the bones of, 440.

NOSOLOGY, 20.

NOSTRUMS.—Remedies of which the ingredients and mode of preparation are kept secret, or confined to the proprietors by letters patent, 184.

NOURISHMENT (see *Food*), Use and effects of, 13 *et seq.*; mineral elements of, 15; quality and quantity for invalids, 17; articles of, suited to infants, 283; articles of, suited to the nursery, 290; various kinds of, suited to invalids, 246 *et seq.*

NURSE, and nursing adults, 337, 338; for the lying-in room, 497, 498.

NURSES, Wet, should be selected from those which are in good health, a point which should, if possible, be determined by a competent inspector. The age of their own child should as near as possible be the same as that of the one they are wanted to suckle, or certainly with not more difference between them than one or two months, as the quality of the milk varies greatly in the different months of lactation. The age of the nurse is often considered of great importance; but many forty years old are better than others at eighteen or twenty who have inferior health and worse "breasts of milk." The milk when drawn should be white, with a very slight tint of blue, sweet in taste, and not too creamy and rich, which kind will disagree with the stomachs of most babies. The breasts should be full, but *not fat*, the glands and glandules feeling distinct beneath the fingers, and the veins not too prominent, which last, when present, is a sign of a scrofulous constitution, though

not an infallible one. The nipple should be well developed, so that the child can readily lay hold, and the temper, *previous habits*, and morals should be ascertained to be good, as there is no doubt that the first, when bad, will affect the milk, while disease contracted by the nurse is capable of being transmitted to the child.

NURSERY-MAID.—This attendant on the child is much more important to the welfare of the child physically as well as morally than the monthly nurse, who has hardly time to do much harm to her charge, unless she actually causes its death; and this, moreover, is a much less serious mischief than the destruction of bodily, mental, and moral health, of which a careless and wicked nursery-maid may be the cause. Many opposite qualities are required, which it is rare to find embodied in one person. Thus, a good nursery-maid should be lively enough to amuse children, yet sedate enough to check herself and them from exceeding the bounds of prudence and propriety. Firmness on all important points should be united with that yielding to the wishes of the child which is peculiar to the good-natured person. Joined to these characteristics, there must be a vigorous state of health, and yet a lively appreciation for, and sympathy with, the ailments of the child. In a word, there should be an old head upon young shoulders, a combination which would be gratefully accepted in more situations than this. The position is one which few will envy; and yet there are many young persons who go through their duties with positive pleasure, their instinctive fondness for children carrying them through them without that sensation of irksomeness which the long-continued nursing of a child invariably brings to any member of the male sex. It is, no doubt, a providential provision for the care of the infant, and we all have to be grateful for it in the early part of our lives; but too often, though sufficiently developed to induce a girl to undertake the task, it is accompanied by a total want of principle, and love of deception; whilst the children cannot avoid imitating what is constantly before them, and unconsciously imbibe similar practices to those which they see successfully indulged in by her. The moment the nurse has anything to conceal from her mistress, she is compelled to enlist the child on her side, because she knows that otherwise it will be revealed on the first occasion; and she, therefore, makes herself so agreeable by bribery on the one hand and by threats of punishment on the other, that the child is induced to promise silence, and henceforward becomes an accomplice. This is the secret of half the stolen rewards, threats of "bogies," &c., which are so prevalent in the nursery in spite of all orders to the contrary; and which, being supernatural, are called down in order to overwhelm the fear of the mother's displeasure by a still higher terror. "If you tell your mamma, the bogie will run away with you," is the surest means of causing submission, and is constantly appealed to with success. If mothers only knew to what a guidance they often resign their children at the age when impressions are most easily made, they would, in the first place, take more care to superintend the nursery themselves; and, in the second, they would investigate more closely the education and moral condition of the nursery-maid. Why do so many children dread darkness, but because they have had it peopled by their maids with all sorts of horrible forms? There is nothing *naturally* frightful in the absence of light; and the child brought up under the eye of a conscientious mother or nurse has no more fear at that time than it has in the broad daylight; so that, when such a feeling exists, it may always be known that some one has been tampering with the child. A middle-aged nurse is seldom possessed of sufficient animal spirits to bear the rude assaults of a number of children, and will generally be too apt to subdue their exuberance to a level with her own staid feelings. Such, however, is not always the case; and then the nurse may be a good one, even if she is fifty years of age; and such a person I have sometimes met with, as an exception to the rule which would perhaps assign thirty-five as the probable limit. A very young girl has seldom had experience enough to undertake a child from the month, and should commence the care of children as under-nurse, where she is as much controlled by her superior as the children themselves, and where her physical energies are of service when properly kept in order. In selecting, therefore, a nurse to take the child at the end of the time when the monthly nurse gives it up, it is well to err on the side of mature age; and, as all nurses have some peculiarities in their management, which, though perhaps themselves not over good, yet will not bear a sudden change, it is advisable that the new nurse should be introduced to her charge some few days before she undertakes its entire management, so that she may see all that is done, and avoid making sudden, and therefore injurious, alterations.

NURSERY.—When there are several children besides an infant in arms, the nursery for the latter should be apart from that given up to older children, who are too riotous for the tender limbs of the new-born child. It should be kept warm, but airy; and in winter, as well as the cold weather of spring and autumn, must have a fire night and day. As soon as the baby is weaned, and able to run about, it may be turned into the general nursery. A day and night nursery are also required, if possible; but there is no objection to an infant being *at night* in the same room with the other children, as they generally sleep pretty soundly.

(*a*) *The aspect of the nursery* is a point of the utmost importance, as I am confident that the health of its inmates mainly depends upon it. Light direct from the sun is of the greatest service to the child; and even if it is not submitted to the full rays, yet the room itself ought to be fully cleansed by them. This subject is more fully entered upon at page 9.

(*b*) *The proper ventilation of the nursery* is a very difficult subject, for children are very liable to the injurious influence of cold draughts of air, and yet require plenty of it in a pure and uncontaminated condition. The only way to effect this is to give space enough to contain such a bulk of atmospheric air as will last, with slight additions, from the time of going to bed until the morning. It is common enough to crowd four or five children and one, or even two, nurses into a room fourteen or fifteen feet long by twelve or thirteen wide, and eight or nine feet high. This space, when compared with that which is calculated at page 8 to be requisite for the purpose of respiration, will appear wholly inefficient, and a room of the above size should not be made to hold more than a nurse and one, or at most two, children.

(*c*) *The heating and lighting* of the nursery may be regulated by the remarks made at pages 6, 7, 8, and 9, on the management of inhabited rooms in general.

NUTS.—See *Fruit.*

NUTMEGS AND MACE are both obtained from the nutmeg tree, of which there are three species—*Myristica fragrans*, *M. fatua*, *M. malabarica.* Together, they are the fruit of the tree, which is similar in appearance to a pear-tree, and produces a fruit about the size of a peach, but shaped like a pear, and smooth externally. The outer fleshy part of this is the pericarp, and this when ripe separates into two longitudinal sections, within which lies the seed proper, or *nutmeg*, enclosed in two coats, besides the *mace*, which fills up the space between these and the pericarp. The tree, known to botanists as *Myristica fragrans*, is cultivated in the Molucca Islands, as well as in Java, Sumatra, Singapore, Penang, the Island of Bourbou, Bengal, Madagascar, and the West Indies; and these trees produce the *true nutmeg* of commerce, which is round, and of a strong aromatic flavour and smell. A second and inferior kind, called the *wild* or *false nutmeg*, is obtained from the *Myristica fatua* and *M. malabarica*, growing in a wild state; and they may be distinguished from the true nutmeg by being longer and paler than it. *Mace* is also *true* or *wild*, according as it is obtained from either kind of nutmeg tree. As imported into this country, the true mace is of a golden or orange yellow, transparent and horny. False or wild mace is of a dark red colour, and deficient in flavour and smell. The *nutmeg*, as well as the *mace*, contain a fixed, and also a volatile, oil, as well as starch and woody matter.

NUX VOMICA, or *Crow-fig*, is the seed of the *strichnos nux vomica*, whose active principle is strichnine.

NUX VOMICA, Symptoms of poisoning by, 175; treatment of, 511.

OAK BARK is the bark of the common oak, such as is used for the purposes of tanning. It is a powerful astringent, but chiefly used externally, being superseded, for internal use, by tannin and gallic acid, as well as by other astringents.

OAK BARK, Decoction of, 233.

OATS AND OATMEAL.—See *Flour*.

OATMEAL GRUEL, for Infants, 283.

OATMEAL PORRIDGE, 291.

OATMEAL POULTICE, 264.

OATMEAL PUDDING, 292.

OBSTETRICS, Synonymous with midwifery. See *Management of Labour*, 497.

OCCIPUT.—The back of the head.

OCCIPITAL BONE.—A bone at the back of the skull. See *Skeleton*.

ŒDEMA, Nature of, 75; treatment of, 404, 405.

ŒSOPHAGUS (*the gullet*), spasm of, 91. See *Alimentary Canal*.

OILS are divided into fixed and volatile, the latter being capable of distillation without decomposition, while the former are not. They are also classed as animal and vegetable, but the two agree in so many essentials that the division is scarcely advantageous for medical purposes.

(*a*) *Fixed oils*, in general, have a feeble but peculiar odour, and little taste; and those which have any, depend upon some volatile oily principle for it. They are insoluble in water, and, with the exception of castor-oil, but slightly soluble in alcohol. Their consistence varies from that of the thinnest olive-oil to that of solid suet, the difference depending upon the proportion of two elements of which they are composed, called respectively *elain* or *olein*, and *margarin* or *stearin*. Fixed fats, when in contact with alkaline solutions, become converted into soap. The fixed oils which are used in medicine are as follows:—Almond-oil, castor-oil, croton-oil, linseed-oil, olive-oil, and cod-liver-oil, each of which is alluded to in its proper place.

(*b*) *The volatile oils* are exceedingly numerous in the vegetable kingdom to which they are confined. They are mostly procured by distilling the plants which contain them with water; for though their boiling point is above that of the latter, yet at 212° F., they are carried over mechanically and condensed with the steam. When pure, they are nearly colourless, their odour is powerful and peculiar to each, and their taste pungent and burning. They mix in all proportions with fixed oils. They are divided into three kinds, viz.:—1st, Those composed of carbon and hydrogen only; 2nd, of carbon, hydrogen, and oxygen; and 3rd, those containing in addition sulphur and nitrogen. To the *first* belong essence or spirit of turpentine, essential oil of lemons, orange, bergamot, pepper, cubebs, juniper, copaiba, elemi. The *second* comprise the oils of aniseed, cumin, cedar-wood, winter-green, valerian, camphor, peppermint, lavender, rosemary, orange flowers, ottar of roses, and some others. The *last* division is composed of the oils of mustard, garlic, assafœtida, and onions.

OINTMENT, Nature of, 239; of creasote, *ib.*; compound of galls, *ib.*; of iodide of mercury, *ib.*; of iodide of potassium, *ib.*; of nitrate of mercury, *ib.*; of nitric oxide of mercury, *ib.*; of savine, *ib.*; compound of sulphur, 240; of zinc, *ib.*

OLD AGE, and its Diseases. See *Age.*

OLECRANON, or *Elbow*, Fracture of, 434.

OLIVES, or *the Fruit of the Olive*, are oval, with a smooth rind, and much resemble small half-ripe plums. For the purposes of the dessert they are gathered when immature, and are then pickled in salt and water, and barrelled for exportation. The Italian olives are the best, then the French, and lastly the Spanish, which are not so well flavoured. The ripe fruit is gathered and gently pressed, by which the best quality of oil is procured, after which a stronger pressure is applied, so as to break the kernels and produce a more copious flow of inferior oil, but still of a quality sufficiently good for many purposes. The oil is allowed to rest and deposit its fecula in the shape of mucilage and earthy matter, and it is then drawn off. The best qualities are at once deposited in flasks of the shape peculiar to the article, and guarded with rushes; whilst the secondary sorts are sent over to this country in jars and barrels. Italian oil is always distinguished under the heads of Florence, Lucca, and Gallipoli—the first being considered the best.

OLIVE-OIL, Medical employment of, 240.

OMENTUM.—See *Caul.*

ONION.—See *Vegetables.*

OPHTHALMIA, Symptoms of common acute, 162; of chronic, *ib.*; purulent, *ib.*; strumous, *ib.*

OPHTHALMIA, Treatment of purulent, in new-born infants, 279; of strumous, in children, 332.

OPHTHALMIA in the Adult, treatment of common acute, 489; of chronic, *ib.*

OPIUM, Medical properties and use of, 240; confection of, 230; liniment of, 237; tincture of, 245; wine of, 246; symptoms of poisoning by, 174; treatment of poisoning by, 510.

OPODELDOC.—The old, but now popular, name for *Soap Liniment*, 237.

ORANGES.—See *Fruit.*

ORANGE-PEEL, Infusion of, 235.

ORANGEADE, Method of making, 250.

ORBIT.—The cavity in the skull in which the eye is placed.

OSMAZOME.—The peculiar principle upon which the flavour of meat depends.

OSSIFICATION.—The conversion into bone, or some substance resembling it. Healthy ossification is the secretion from the blood-vessels, and deposit in their proper places, of particles of phosphate of lime, and other mineral ingredients, by which the soft cartilage or membrane is made hard and firm, but brittle (see *Structure of Bones*, 92). Diseased ossification is the deposit of earthy matter, not exactly of a bony character, in certain situations where it is absent in health, and where its presence is often of serious consequence, as in the interior of the arteries and heart, or in the disease called *osteo-sarcoma.*

OVARY.—A small oval organ on each side of the pelvis of the female in which the *ovum*, or future child is developed, and from which it passes to the womb.

OVARIAN DROPSY, Symptoms and treatment of, 495.

OXALIC ACID, Symptoms of poisoning by, 172; treatment of, 508.

OX-GALL, when inspissated or partially dried by evaporation, is sometimes used as an aperient; but it does not appear to possess any advantages over those already in use.

OXIDE OF MERCURY.—See *Pill of Mercury*, 241, and *Mercury with*

Chalk, 238; both of which are composed of it, mixed with an appropriate vehicle.

OXIDE OF ZINC, 246.

OXYGEN is a gas existing in a free state in the air, mixed with nitrogen. It is somewhat heavier than this gas, and, consequently, than air itself, which is a mixture of the two. It is the great supporter of combustion and respiration, and unites with metals to form what is called an oxide; also with them or with other substances to constitute the greater part of our acids. Many substances combine with it in different proportions so as to form a *protoxide*, *deutoxide* or *binoxide*, *teroxide*, &c.

OXYMEL.—A mixture of honey and vinegar, sometimes medicated, as oxymel of squill, 240.

OYSTERS.—See *Fish*.

OZONE is most probably some peculiar modification of oxygen, the nature of which is not very clearly made out. It appears to depend upon the amount of electricity in the atmosphere; and by Professor Schoenbein, who was the first to draw attention to it, it was supposed to be connected with the appearance and progress of epidemic diseases.

OZŒNA.—A profuse and fetid discharge from the nostrils.

OZŒNA, Treatment of, 491.

PACKING, Various modes of, in *hydropathy*, 206.

PAIN.—This sensation so well known to all of us is implanted in us by Nature in order to make us guard against mechanical injuries, and also to allow her to repair them when already effected, as well as those which are the result of other causes, and known as "disease." Pain may, therefore, with a single exception be considered as an invariable sign of something being wrong, for in a state of perfect health and freedom from accident, no pain is ever felt. This exception is the natural process of "labour," in which pain is an ingredient apparently for a wise purpose—namely, to compel the parent to attend to herself as well as the child at that time, without which she might be sometimes inclined to neglect one or both. The amount of pain experienced by different individuals, and in different situations of the body, varies greatly, depending in the first upon the condition of the nervous system, and in the second, upon the nature of the organ attacked. In none is the pain so severe as when the seat of the disease is the nerve itself, *tic doloreux* being so named from the excessive pain which is produced. Next to the nerve, the bones and joints probably occasion the greatest suffering, apparently from their unyielding nature, so that when they are swollen by disease, their nerves are pressed upon with the above result. Very often the pain produced by disease is in an inverse ratio to the sensibility of the part in health, as is the case with the internal organs, and with the teeth, bones, and joints, all of which are almost insensible when cut or handled, until they become inflamed.

PAIN is one of the four symptoms of inflammation, 41, and also attends congestion, *ib.* It is present in hysterical simulations of active local inflammation, 150; and, in fact, in most of the diseases to which the body is subject, including especially malignant affections, 160, in which it is generally very acute. Pain in the limbs and back is a symptom of simple fever, 24, as well as of most other kinds of fever. Pain in the stomach may be a sign of indigestion, or dyspepsia in some form, 155, 156, or of spasm of the stomach, 418. Pain in the head is commonly known as headache, 125, 126. Pain in the side, commonly known as "stitch," is by physicians called pleurodynia, 81, 410. Pain in the chest, increased on inspiration, may be owing to this cause or to pleurisy, 79, 80, or pneumonia, 76, or to a broken rib, 440. Pain in the bowels may be merely ordinary "griping," from some acrid kind of food; or it may be due to colic, 91; or to inflammation of the peritoneum, 82 *et seq.*; or to diarrhœa or dysentery, 52; or to cholera, 54. See also *Earache*, *Toothache*, &c.

PAINTER'S COLIC, Symptoms of, 91; treatment of, 418.

PAINTER'S PALSY (*Wrist-drop*), 463.

PALATE.—This part of the mouth is divided into the hard and soft, the former being composed partly of the horizontal portion of the upper jaw, and partly of the palate-bone attached to it; the latter is made up of two folds of mucous membrane on each side, called the arches of the palate, between which are the tonsils, and in the middle hangs the *uvula*. These folds are raised and lowered by muscles, as also is the *uvula*, and the sense of taste is mainly resident in the nerves distributed to them, but partly also in those of the back of the tongue.—See *Taste*.

PALATE, Cleft, nature of, 165; treatment of, 491.

PALPITATION OF THE HEART, Nature of, 144; treatment of, 476.

PALSY, or *Paralysis*, Various kinds of, 124, 125; treatment of, 462.

PANADA.—A food for children and persons in extreme old age, made by beating up to a fine pulp bread previously soaked in boiling water. It is then sweetened and made palatable with the addition of a little milk or cream.

PANCREAS, Structure of, 95; disease of, 102; treatment of, 445.

PAPULA, or *Pimple*, Definition of, 70.

PAPULAR ERUPTIONS, Nature and varieties of, 70, 71—as lichen, 70; prurigo, 71; treatment of, 389.

PARASITIC ANIMALS, 157; removal of, in the child, 333; in the adult, 486, 487. See also *Porrigo*.

PARALYSIS, or *Palsy*, Symptoms of its various kinds, 124, 125; treatment of, 462.

PARAPLEGIA (*a form of paralysis*), 125; treatment of, 463.

PAREGORIC (*compound tincture of camphor*), 245. Half an ounce contains one grain of solid opium.

PARIETAL BONE.—A square bone on each side of the skull. See *Skeleton*.

PAROTID.—The largest of the salivary glands, situated just in front of the ear, between it and the lower jaw, which it overlaps internally as well as externally; so that, by the movements of this part in mastication, the gland is excited to secrete its fluid. The duct of the gland opens into the mouth opposite the second molar tooth in the upper jaw on each side.

PAROTID GLAND, Symptoms of inflammation of the, 107—as simple inflammation, *ib.*; and mumps, *ib.*; treatment of, 452.

PAROXYSM.—An excessive aggravation of the symptoms of a disease, which may be periodical as in ague, or otherwise as in gout, hysteria, &c.

PARSNIPS.—See *Vegetables*.

PARTURITION (*labour* or *delivery*), Management of, in the healthy female, 497, 498; unnatural labours, 499; symptoms of diseases and accidents incidental to, 169; treatment of the same, 504; treatment of the mother after delivery, 501.

PASTRY.—A department of cookery which should be kept within the most rigid bounds of moderation as to the use of butter and lard, when intended for the stomachs of children and invalids.

PATELLA (*the knee-cap*).—A small bone of a heart-shape which lies in front of the knee, and has the strong extensors of the leg inserted into its upper edge, while its lower is attached by a strong ligament to the *tibia*.

PATELLA, Symptoms and treatment of fracture of, 438.

PATENT MEDICINES.—See *Quackery* and *Nostrums*.

PATHOLOGY.—The science which treats of the exact nature or essence of disease.

PATHOLOGICAL ANATOMY.—The art by which the effects of disease, as exhibited after death, are shown by means of dissection, or *post-mortem* examinations.

PEAS.—See *Vegetables* and *Flour*.

PEACHES.—See *Fruit*.

PEARS.—See *Fruit*.

PEARL-ASH (*impure carbonate of potass*).—Symptoms of poisoning by, 172; treatment of, 508.

PEARL-SAGO suited for Infants, 284.

PEARL-BARLEY.—See *Flour*.

PEDICULI, or *Lice*, Removal of, 487.

PELLITORY of Spain, 240.

PELVIS (*bony*).—See *Skeleton*. Its *cavity* is divided from the abdomen by an imaginary line (see *Abdomen*), and contains the rectum and bladder, with its appendages in the male, and in the female besides these organs, the womb and ovaries.

PELVIS, Inflammation of the mucous surfaces of the organs within, 56—as of the bladder, *ib.*; of the urethra, *ib.*; of the womb, *ib.*; treatment of the same, 380; treatment of fracture of the bones of the, 439.

PEMPHIGUS, Symptoms of, 66; treatment of, 312, 386.

PENNYROYAL.—See *Mint*.

PEPPER.—This well known condiment is the produce of two allied plants (known as *piper nigrum* and *longum*), and the part used is the berry dried in the sun. *Black* and *white pepper* are both obtained from the berry of *piper nigrum;* the former being the entire berry ground, while the latter consists of the berry deprived of its outer covering or husk, before it is reduced to powder. Long pepper is not ground, and is not much used in the present day. Peppercorns, being these berries, are imported from Penang, Malabar, and Sumatra. The best are those which are not too small, nor too much shrunk in drying, but which feel heavy in the hand, and sink in water. In looking at a section the outer part, which is black or reddish-black, is easily distinguished from the inner or central, which is more or less white, and brittle, hard towards the exterior, and soft and powdery towards the centre. In separating these parts, as for the purpose of procuring the white pepper, an inner reddish covering remains attached to the internal white structure, and this being ground up with it, is faintly indicated in the pure white pepper-powder by small reddish specks. The active properties of this spice depend upon an *acrid resin*, an *essential oil*, and a substance before alluded to, called *piperine*. The outer cortical part contains the resin, in the inner coat lies the oil, and within the internal or white structure is the *piperine*. Black pepper is used in medicine chiefly for piles, and another species called *cubebs* is employed in inflammation of the mucous membrane of the bladder and urethra. See *Cubebs*.

PEPPER, Confection of, 231.

PEPPERMINT.—See *Mint*.

PEPPERMINT, Essence of. — The essential oil of *mentha piperita*. See *Mint*.

PEPPERMINT WATER. — Water flavoured with the essence of peppermint, either distilled over from a decoction of the herb, or made by mixing the essence with water as required, by means of a little sugar and spirit, to rub it down and cause its suspension in the water.

PERCUSSION.—A mode of examining the chest and abdomen by striking them gently with the ends of the fingers, when the sound given out gives an indication of their state with regard to solidity. Thus, a practised hand and ear can discover by percussion whether or not the lungs are solidified by disease, after which, by other symptoms, its exact nature may be made out by other means. A dull sound on percussion of the chest merely indicates that the air-cells are filled up, or that water or pus has taken the place of the healthy lungs. Thus, when the ear is satisfied of the entire want of resonance, the task still remains to ascertain whether the defect is owing to the *deposit of tubercles*, or to *hepatization* in consequence of pneumonia, or to *empyema* or *dropsy* of *the chest* (see *Chest, Examination of the*). So also in reference to the contents of the abdomen, percussion will indicate the extent of any enlargement of the liver, or of the spleen; or if there is any tumour growing there, its presence will be shewn by a dull sound on percussion of the parts in front of it. See *Abdomen, Examination of the*.

PERICARDIUM.—The bag which encloses the heart (see *Heart, Anatomy of*), and which is externally fibrous and internally serous in its nature.

PERICARDITIS (*inflammation of the pericardium*), Symptoms of, 81; treatment of, in children, 315; in adults, 410, 411.

PERICRANIUM. — The *periosteum* covering the skull is so called.

PERINŒUM.—The triangular space in front of the *anus*, between it and the bones of the *pubes* and *ischium*.

PERINŒAL FISTULA.—See *Fistula*.

PERIODIC.—This term is applied to certain diseases, as well as natural secretions, which recur at fixed intervals, such as *ague*, *remittent fevers*, and *brow-ache* among the former, and *menstruation* among the latter.

PERIODIC FEVERS, Symptoms and causes of, 27 *et seq.*—as ague, 27; remittent fevers, 28; yellow fever, 29; infantile remittent, *ib.*; hectic fever, 30.

PERIODIC FEVERS, Treatment of, in the child—as infantile remittent, 298; in the adult—as ague, 356; adult remittent, 357; yellow fever, 359; hectic fever, *ib.*

PERIOSTEUM. — The membrane covering the bones throughout the body, and closely attached to them.

PERIOSTEUM, Symptoms of inflammation of the, 93; treatment of, 429.

PERISTALTIC MOTION.—The consecutive contractions of the muscular fibres covering the intestines, by which the food is propelled, are called *peristaltic*. See *Alimentary Canal*.

PERITONEUM, Structure of, 81; congestion and inflammation of the, 81 *et seq.*—as acute peritonitis in the infant, 82; in the adult, *ib.*; chronic peritonitis in the child, 83; in the adult, *ib.*; enteritis, 84.

PERITONITIS, Treatment of, in the child, 315, 316; in the adult, 411, 412.

PERSPIRATION. — The aqueous fluid secreted by the skin, 46. See also *Diaphoretics*, 348; *Eruptive Fevers*, 31 *et seq.*; and *Skin Diseases*, 57 *et seq.*

PERUVIAN BARK.—The popular name for *Cinchona*, from Peru—the country where it was first employed.

PERUVIAN BALSAM, Properties of, 240.

PESSARY, 495.

PESTILENCE.—An *epidemic* or *endemic* disease.

PETECHIÆ.—Small purple or dark red spots which make their appearance in typhus fever from the blood-vessels giving way. At first they resemble flea-bites, but afterwards they are much darker, and generally also considerably larger.

PHAGEDENIC ULCERS (also called *Gangrenous* and *Sloughing*), Symptoms and treatment of, 395.

PHARMACY.—The art of preparing medicines for use in medicine and surgery.

PHARYNX.—The muscular funnel at the back of the mouth, which intervenes between the mouth and the gullet. It consists of three layers of muscle, which seize each morsel of food, and force it downwards into the gullet, the soft palate and the back of the tongue being brought together at that moment by the lowering of the former and the raising of the latter, while the epiglottis covers the opening of the larynx, and thus the food being pressed upon is compelled to enter the gullet.

PHLEBOTOMY.—The artificial opening of a vein. See *Bleeding*, 256.

PHLEBITIS.—Inflammation of a vein, which may occur after bleeding, or sometimes from other causes, especially where the veins are varicose, 143. Phlebitis is characterized by pain and redness, with a cord-like feeling along the course of a large vein. It is very dangerous when it reaches the large veins of the trunk of the body, and should, therefore, be treated with great care and promptness in its early stages. The treatment consists in the application of a number of leeches along the course of the veins, followed by exactly the same remedies as are prescribed for inflammation of the absorbents, 455.

PHLEGM.—This term is given to mucus formed in the air-passages.

PHLEGMASIA DOLENS, or *White Leg*, Nature and treatment of, 506, 507.

PHLEGMON and *Phlegmonous Inflammation* are synonymous terms, employed to describe a particular inflammation of the cellular membrane, 75; treatment of, 405.

PHOSPHATES.—Compounds of phosphoric acid with lime, soda, magnesia, &c.

PHOSPHORUS.—An elementary substance existing in nature in combination with oxygen, forming phosphoric acid and the various phosphates. When pure it resembles wax, and is soft and flexible at common temperatures, but is so easily inflammable as to take fire at the temperature of the human body, and cannot therefore be handled with impunity. Though the phosphate of lime enters largely into the composition of the bones, phosphorus itself is a virulent poison, even in small doses; and it has lately been extensively employed to destroy insects, mice, rats, &c., in the form called *phosphor paste.* Unfortunately, it has also been made use of as a poison for human beings; and several convictions have occurred during the present year, which will make it imperative on the legislature to place some restriction on its sale, as in the case of arsenic. It produces intense inflammation of the stomach, for which no treatment is of much service, though if such an accident occurs, the same means as are recommended for arsenic, 509, may be tried.

PHRENITIS (*inflammation of the brain*), Symptoms of, 120; treatment of, 461.

PHRENOLOGY, Etymology of, 216; utility of, as a curative agent if founded on fact, 217; Gall and Spurtzeim, the inventors of, *ib.*; when tested, found to be inoperative, *ib.*

PHTHISIS (*pulmonary consumption*), Symptoms of, 135; treatment of, 470, 472.

PHYSIC, Modern principles of, 183; practice of, *ib.*

PHYSIOGNOMY.—The science which treats of the indications afforded by the countenance of the mind of the individual, and of his state of bodily and mental health. See *Countenance.*

PHYSIOLOGY.—The science which treats of the functions of organized beings, and of their structure, as far as is connected with their functions.

PICKLES.—Vegetables preserved in vinegar, and eaten as a relish with animal food. In small quantities they are wholesome to a sound stomach, but for the invalid they are seldom to be recommended.

PILES, or *Hemorrhoids*, Nature and symptoms of, 143, 144; treatment of, 474, 475.

PILLS, Nature of, 240; of aloes (compound), *ib.*; of aloes with myrrh, *ib.*; of colocynth (compound) *ib.*; of galbanum (compound), *ib.*; of iron with myrrh, *ib.*; of mercury (blue pill), 241; of the chloride of mercury (compound), *ib.*; of rhubarb (compound), *ib.*; of soap (compound), *ib.*; of squill (compound), *ib.*

PILLS, Formulas for various. See *Tonics*, 341, 342; *Antisquamics*, 343; *Astringents*, 345; *Expectorants*, 345; 346; *Cathartics*, 347; *Diaphoretics*, 348, *et passim*, (Part II).

PIMENTO, or *Allspice*, also called *Jamaica Pepper*, is the berry of a tree bearing the first name, and growing in the West Indies, from which it is imported in bags. There are two qualities of it, but one only is extensively used in this country. Like most other spices, it owes its qualities as a condiment to its essential oil, which is contained in considerable quantities in the berries mixed with gummy and resinous matter, astringent extract, and fatty oil. This essential oil is readily obtained by distillation.

PIMPLES.—See *Papula* and *Diseases of the Skin.*

PINE APPLES.—See *Fruit.*

PINS-AND-NEEDLES.—This term

is applied to the peculiar pricking sensation which attends upon the return of sensibility after it has been impaired either by temporary pressure upon a nerve, or by paralysis as the result of disease. It is almost always an indication of returning nervous power, though sometimes in chronic cases of disease of the brain or spine, it ushers in the attack, and is followed by palsy.

PINS, as well as needles (see article *Needles*), are sometimes swallowed by accident, but possessing heads they do not so readily make their way out again. They are, however, readily dissolved in the stomach by the action of the acids, therein contained, on them, and if left alone will seldom do much mischief. Unless, therefore, a pin is clearly visible sticking in the back of the throat, it is better to leave it alone, giving occasionally a little vinegar to assist in the solution of the metal.

PITCH, Burgundy, 241.

PITCH PILLS, 343.

PITYRIASIS, or *Dandriff*, Nature of, 71; treatment of, 389.

PLACENTA (the *after-birth*). — A spongy or cellular substance, by which the child is nourished during its existence in the womb prior to birth. It adheres to the interior of the womb, and its cells communicate with the large veins of that organ in a peculiar manner, but so as to allow the blood of the mother to pass freely into it, and thence to the child through the umbilical cord or navel-string.

PLACENTA, Management of the, in labour, 499.

PLAGUE, Nature and symptoms of the, 40; treatment of, 362.

PLASTERS, Nature of, 241; of ammoniacum, with mercury, *ib.*; of belladonna, *ib.*; of cantharides, *ib.*; of lead, *ib.*; of soap, *ib.*

PLASTIC.—See *Inflammation* (*par.* 124).

PLETHORA, Nature and symptoms of, 131; treatment of, in children, 322; in adults, 467.

PLEURA. — The serous membrane covering the lungs (pulmonary-pleura) and that lining the chest (costal-pleura).

PLEURITIS, or *Pleurisy*, &c.—Inflammation of the pleura.

PLEURITIS, Symptoms of acute, 79; of chronic, 80; treatment of, 409, 410.

PLEURODYNIA (*muscular pain in the side*), diagnosis from pleurisy, 81; treatment of, 410.

PLUMMER'S PILL.—See *Compound Pill of the Chloride of Mercury*, 241.

PNEUMONIA (*Inflammation of the cellular tissue of the lungs*), symptoms of, 76; diagnosis from bronchitis, 77. See also article *Lungs, Inflammation of the.*

PNEUMONIA, Treatment of, in children, 315; in adults, 406, 407; treatment when combined with bronchitis or pleurisy, 408; treatment when occurring at the same time with typhus fever, small-pox, or measles, *ib.*

POISONS, Symptoms of the effects of the various kinds of, 170 *et seq.*—as general remarks, 170; proofs of having been taken, 171; symptoms of irritant poisons, 171, 175; of narcotic poisons, 175, 176; of narcotic irritants, 176, 177.

POISONS, Treatment of the effects of, 507 *et seq.*—as the use of the stomach-pump, 507; treatment of the effects of the irritant poisons, 507, 509; of narcotic poisons, 510; of narcotic irritants, 511.

POLYPUS of the Ear, Nature of, 164; of the nose, 165; treatment of polypus of the ear, 491; of the nose, *ib.*

POMEGRANATE, Root and bark, 241.

POMPHOLYX, Nature of, 66; treatment of, 312.

POPLITEAL SPACE.—Behind the knee is a deep hollow, which is made by the prominence of the tendons and muscles on each side. In this the principal artery of the leg, called here the *popliteal*, lies buried in fat. It may be readily felt pulsating if deep pressure is made; and by the use of a pad, with the tourniquet, or other means, it may be compressed so as to prevent hemorrhage, 477. See *Diagram* of

parts where pressure may be made in wounds of arteries, &c., 447.

POPLITEAL ANEURISM. — The popliteal space is one of the most common seats of aneurism, where it shows itself by the usual symptoms, 141; treatment of, 473.

POPPY.—The source of *opium*, 240.

POPPY-HEADS, Decoction of, 233.

PORRIGO (*scall'd head*), Symptoms of, 67; treatment of, 313.

PORRIGO DECALVANS.—Another name given to the disease of the scalp, which is described in this book as *alopecia circumscripta*, (a peculiar form of *baldness*), 73.

PORK.—See *Meat*.

PORTER.—See *Malt Liquors*.

PORT-WINE.—See *Wines*.

PORT-WINE, Directions for mulling, 249.

POSITION.—See *Kinesipathy*, 209.

POTASS (*potassa*).—See *Alkali*.

POTASS, Liquor of, 237; acetate of, 241; bicarbonate of, *ib.*; bitartrate of, *ib.*

POTASSIUM, 241; iodide of, *ib.*; bromide of, 242.

POTATO.—See *Vegetables*.

POULTICE, Nature of, 242, 263; various kinds of, *ib.*—as bran poultice, 263; bread poultice, *ib.*; linseed-meal poultice, 264, 242; oatmeal poultice, 264; yeast poultice, 264, 242; mustard poultice, 264, 242; carrot poultice, 264; hemlock poultice, 264, 242; charcoal poultice, 242.

POWDERS, Nature of, 242; of antimony (compound), *ib.*; of chalk with opium (compound), *ib.*; of ipecacuanha (compound), *ib.*; of mercury with chalk, 238.

POWDERS, Formulas for children's, 268, 269; for aperients useful for adults or children, 348; for diaphoretic purposes, *ib.*

PRECIPITATE.—Any powder thrown down from a solution is so called in chemistry; but there are two which receive the special names of WHITE PRECIPITATE (*the ammonio-chloride of mercury*), and RED PRECIPITATE (the *nitric oxide* of the same metal).

PRECIPITATE, Red, symptoms of poisoning by, 173; treatment of, 509.

PREDISPOSITION.—A term used to signify a peculiar tendency to disease either from *diathesis*, or hereditary influence, or from any acquired habits, which have produced a bad effect upon the system.

PREGNANCY. — The state of the female from conception to delivery. It is accompanied by certain uncomfortable attendants and signs, &c., which it is sometimes desirable to know.

(*a*) *The signs of pregnancy* are—*firstly*, the cessation of menstruation, though this alone is by no means a reliable sign, the secretion ceasing sometimes from other causes, and now and then continuing during the early part of pregnancy. Nevertheless, it may be taken *with others* as a useful sign. *Secondly*, morning sickness may be considered, though not a proof, yet a very suspicious evidence of pregnancy. This symptom generally shows itself about the fourth or fifth week, and lasts till about the fourth month. In healthy women, the sickness is soon over each day that it is felt; but in some cases it is almost constant, and scarcely any food remains on the stomach. *Thirdly*, the breasts enlarge, generally beginning to do so about two months after conception. They feel full, and throb; while the nipples are sore, and tingle. The glandular or knotty feel of the breasts becomes more apparent, and the *areola* round the nipples becomes larger and darker, with a development of little raised whitish-yellow pimples, to the number of eight or ten, on the surface of the areola itself. The nipple also becomes more prominent, and enlarges in diameter, while towards the latter months a few drops of a thin whitish fluid may often be squeezed out. *Fourthly*, the abdomen gradually enlarges in size. During the early months, though the womb cannot be felt above the pelvis, yet as it gradually pushes the bowels up into the abdomen, the size of that part of the body is increased, and with it, to a slight extent, the waist also. During the fourth month, the womb ascends above the bone of the *pubes*, and may be felt in the lowest part of the abdomen as a firm rounded body. From this time it gradually increases in size, and can every week be felt more distinctly, with a corresponding increase of the size of the abdomen and waist. *Fifthly*, there is a great tendency towards evening to flatulence and distension of the stomach, so that the clothes which were loose in the morning become insupportably tight at night, and the stays and other fastenings round the waist are obliged to be loosened. *Sixthly*, some time in the fourth month, or early in the fifth, a sensation is experienced by the mother called "quickening," which is her first perception of the movement of the child. It is at first like a feeble pulsation, but the description varies greatly in different women. *Lastly*, the movements of the child, felt through the walls of the abdomen by the hand placed upon them, are signs which cannot be mistaken by any one who has once felt them. Other signs may be enumerated as serving to guide the experienced *accoucheur*; but as they are not likely to be of service to any one else, they are omitted here. There is, however, one which should not be overlooked, and that is the change in the features and expression of countenance. This is not invariable, but most women about the third or fourth month enlarge about the mouth and eyes, and have a pinched look about the nose, which is very remarkable, though somewhat difficult to describe. The colour of the eyes also becomes paler, and this is especially the case with blue eyes.

(*b*) *The date of conception*, or "reckoning" as it is called by nurses, is usually to be laid at the commencement of the last menstruation; but when this has apparently gone on for one or two periods, considerable difficulty is experienced in making the calculation, the time of the first occurrence of sickness, or of quickening being the only reliable grounds for the reckoning.

(*c*) *The duration of pregnancy* is now generally admitted to be forty weeks, or 280 days, reckoning from the beginning of the last act of menstruation. There is, however, in woman as well as in the females of the domestic animals, a considerable variation in this respect; and there can be little doubt that some go a full month longer than the regular and average period. These, however, are the exceptions, and, as a rule, forty weeks (ten lunar months, or rather more than the average of nine calendar months), may be laid down as the usual period of gestation.

PREGNANCY, Symptoms of diseases incidental to, 168; treatment of, 496.

PREMATURE BIRTH, or *Miscarriage*, 168, 496.

PRESCRIBING.—The principles and practice of, 339 *et seq.*

PRESERVED MEAT and other Provisions.—To the emigrant these are of the greatest importance, not only on his voyage out to his intended home, but often for some time after he has reached it, until he is able to procure a regular supply of fresh meat. The process by which animal and vegetable substances are made capable of resisting the usual effects of death is very similar to that which has long been adopted in the bottling of green gooseberries, but carried on in a manner more suited to the increased tendency to decomposition. Gooseberries require only to be boiled in bottles, and then to be covered from the air while hot, after which they may be kept for a considerable time, the air being, however, only *partially* expelled. In the meat-preserving process, the flesh is likewise submitted to the action of boiling-water; and it is then stowed in canisters, as being cheaper and more safe from fracture, and also more capable of being securely soldered down, and freed from the action of the air. But in addition to these actions, which are exactly similar in principle to the bottling of gooseberries, when the canister is full and ready for sealing, it is again submitted to the action of heat, and by the steam given off all the air is removed, or nearly all, there still remaining a highly-rarified medium. After this it is at once soldered down, and if the process is properly conducted, the meat will keep for a very long time, even in warm climates. Meat thus prepared is imported into this country and sold wholesale at about 5d. to 9d. per lb., according to the quality and kind; inferior beef being to be bought at the lower price, and mutton and veal readily fetching the higher rate. Strong mutton-broth and beef-soup are also preserved in the same way; but none of these have been yet introduced into England at such a price as to make them economical substitutes for fresh meat, the price being as nearly as possible the same. The price of the meats in Australia or Moldavia, where they are preserved, is not more than 1d. per lb.; but the cost of the canisters, and of boiling, packing, and importing, brings them up to the price at which they are sold here. But the more highly priced articles, such as turtle, may be, and are, sold at a rate much cheaper than the fresh material. Thus, a quart-tin of turtle is to be bought for 18s., which will suffice to make soup enough for a large party of eighteen or twenty people, with the addition only of some clear stock and condiments amounting to little more than a couple of shillings. Venison, also, for stewing or for pasties, is sold in the same way, preserved in canisters; but as English fresh venison for this purpose can generally be bought at 8d. per lb., no saving is here effected; and the quality is not very good, foreign venison being inferior to our park-fed breed. Preserved vegetables are only suited to sea-voyages, inasmuch as the price is so much higher than our garden produce when fresh. Peas and beans, and other similar garden produce, may be obtained *when out of season*, preserved in this way, cheaper than in Covent-garden market; but the colour is not good, unless it is artificially produced, and hence the article is not used to any extent in the interior, however well it may be suited for voyages of long duration. There is a prejudice against the use of preserved beef, from the idea that it is composed of horse-flesh; but there is no more reason for the use of this article in the preserving of meat in this way than there is when it is salted and barrelled. There can be no doubt that horse-flesh *may* be substituted for beef in many instances, wherever any kind of curing is carried on; but the object is not very apparent, when it is recollected that, in the preserving process, the tallow is the chief article which brings the money in as a return for the outlay, and this kind of fat in the horse is not nearly of such a good quality as in the ox. If, therefore, it is not the interest of the curer to substitute the one for the other, we may rely upon it that it will not be attempted, except as an exceptional case. A horse coming in their way would probably not be wasted, but on the large scale no such substitute, I believe, really occurs. Healthy horse-flesh is quite as fit for human food as beef or mutton, and is much more short and tender in the grain than the former food; but the price of well-conditioned horses is higher than that of bullocks nearly all the world over, so that it is useless to entertain the question of its applicability as an article of food so long as this is the case. It is now dearer, and it must remain so, because a horse is a more delicate feeder than an ox, and it will cost more by the time it is fit for food, unless it earns its keep by working in the interim; but if capable of doing this, it will be kept until worn out or diseased, and it is then certainly not to be compared with sound and wholesome beef. The microscope does not readily detect the difference between beef and horse-flesh, so that there are no means of distinguishing the one from the other, except by the smell and flavour, which to a practised nose and palato are very easily known from one another. Dr. Hassall, who examined several varieties of preserved provisions, did not discover any such substitution; but he himself admits that it would be "of such a nature as to escape detection," and, as he observes, the substitution of the livers or kidneys would be detected by the texture alone, which would readily serve to show the difference from muscular fibre. That gentleman found in his examinations, that out of thirty-four cases of preserved animal and vegetable substances, twenty-nine were in good condition, five being unsound, of which, however, three were vegetables, and one milk; the only failure in the case of an animal substance being mock-turtle soup, in which decomposition had commenced, and it was scarcely edible. The fish examined by him were all in a good state of preservation, as well as the preserved soups and broths, except only. the mock-turtle. In sudden emergencies, therefore, when soup or broth is required for an invalid, recourse may be had to this article; but there is nothing like fresh-prepared diet for the sick-room; in all cases; and I believe the only exception is in the case of real turtle, which is prepared in a very delicate way for invalids, and which in that way, as soup, is a most convenient and cheap form for the use of the sick-room.

PROGNOSIS, Nature of, 22.

PROLAPSE of the Anus, Treatment of, 428; of the womb, treatment of, 495.

PRONATION.—See *Fore-arm.*

PROSTATE GLAND.—This body, which is about the size and shape of a chestnut, surrounds the neck of the male bladder. It becomes sometimes subject to scrofulous inflammation and abscess in young men, and in old ones is very liable to chronic enlargement. The symptoms and treatment of these affections are, however, too obscure to be alluded to here.

PROTEINE.—A hypothetical compound of carbon, hydrogen, oxygen, and nitrogen, in such proportions as to form readily (with phosphorus and sulphur) albumen, fibrine, and caseine. Those substances which are readily convertible into these materials, in the process of digestion, are called *proteine compounds.*

PROUD FLESH.—See *Fungous Ulcer*, 394.

PRUNES *(dried plums).*—See *Fruit.*

PRURIGO, or *Pruritus*, Symptoms of, 71; treatment of, 389.

PRUSSIC ACID (*Hydrocyanic*), Symptoms of poisoning by, 174; treatment of, 510.

PSOAS ABSCESS, Symptoms of, 139; treatment of, 327.

PSORA, or *Scabies* (*the itch*), Symptoms of, 64; treatment of, 312, 386.

PSORIASIS, Symptoms of, 71; treatment of, 389.

PTYALISM, or *Salivation*, is an effect produced upon the salivary glands by mercury, iodine, and certain other substances, by which the secretion of saliva is enormously increased in quantity, and rendered more glutinous in quality. In the ptyalism of mercury, the glands enlarge, and are so painful that the mouth cannot be opened, while the mucous membrane lining the mouth is inflamed, and often ulcerates to a great extent. Lotions of weak brandy and water, or of water containing half an ounce of chlorinated solution of soda to the half-pint, are the best local applications, with plenty of exercise in the open air (avoiding all wrappings-up of the face), and the occasional use of saline purgatives, such as Epsom salts and cream of tartar, as prescribed at 348.

PUBERTY.—The age at which the sexual organs are developed, which is in this country from thirteen to fifteen.

PUDDINGS may be made of such plain and wholesome materials as to be useful and wholesome additions to *Invalid Diet*, which see for some receipts for making them.

PUERPERAL.—Connected with *Labour.*

PUERPERAL FEVER, Symptoms of, 169; treatment of, 506.

PUERPERAL CONVULSIONS, Symptoms of, 169; treatment of, 505.

PUERPERAL MANIA, Symptoms and treatment of, 506.

PULMONARY.—Connected with the lungs—as *Pulmonary Consumption, Pulmonary Apoplexy,* &c.

PULSE.—The pulsations of the heart and arteries may be felt in any part of their course, where the vessel is near enough to the surface. The situations usually chosen are, the left side of the chest for examining the heart itself, and the radial (or thumb) side of the wrist for ascertaining the general condition of the circulation; that of the head, in particular, being arrived at by placing the fingers on the temporal artery above the ear, where its branches are superficial, or on the carotid as it lies on each side the wind-pipe in the upper part of the neck. By the ear or hand applied to the chest, we may count the number, and estimate the force and regularity of the pulsations of the heart itself; but the pulsations of the arteries teach us this and something more—namely, the quantity of blood sent out at each beat, and the condition of the arteries themselves with regard to contractility, which is materially affected in fever and inflammation. But, after all, the state of the pulse is a fallacious indication when taken by itself; and it is only to be depended on when supported by other symptoms, and examined with a care to avoid disturbing influences, such as the agitation and anxiety which attend upon its being felt, and often upon some mechanical exertion such as walking or running. The chief variations in the pulse are dependent upon (*a*) frequency, (*b*) power or force, (*c*) volume, (*d*) regularity, and (*e*) hardness or softness.

(*a*) *The frequency* of the pulse is easily ascertained by counting the beats with a watch having second hands. The average number of pulsations in the minute varies greatly according to age and health, from 180 per minute to as low as 20 or 30, or even lower still in very rare cases.

TABLE OF FREQUENCY OF PULSE.

Age.	Maximum	Minimum.	Average.
At Birth	165	104	135
1	158	108	128
2	136	84	107
5	133	80	101
10	120	76	91
15	112	60	84
20	106	52	72
25	88	59	73

Beyond 130 or 140 beats per minute, it requires some practice to count the beats; but a skilful finger will be able to detect and register 180 per minute, all numbers beyond which may be set down as guess-work. The frequency is materially augmented by taking exercise, stimulating drinks, mental emotions, heat of the atmosphere, or excessive clothing, lightness of the air, as on high mountains; while it is lowered by sleep, want of food, cold, and fatigue.

(*b*) *The force or power of the pulse* depends upon the power of the contraction of the heart, together with the reaction of the contractile power of the arteries upon the blood driven forwards. It requires for its development a sufficient quantity of blood for these forces to act upon, and is increased when the nervous system is roused, as in fever and inflammation, as well as by stimulants, and all such agents as affect the nervous system.

(*c*) *The volume or fulness* depends partly upon the quantity of blood forced into the arteries, and partly upon their admission of it. Thus, in some inflammations, the heart acts violently, and there is plenty of blood ready to be driven forwards; but the vessels contract with such power that they do not admit much blood into them, and the result is a quick, small, and wiry pulse, as in inflammation of the bowels.

(*d*) *Regularity* depends entirely upon the heart and its supply of blood. If the valves are defective, they occasionally fail to act, and then the pulse intermits; but sometimes the failure arises from the blood not being supplied freely, as in congestion of the liver, and then an intermission in the beats occurs *for a time* only, the usual regularity being recovered when the congestion ceases.

(*e*) *Hardness or softness* depends upon the compressibility of the arteries, which again are affected by their state of contractility; so that *hardness* is a sign of excessive contractility, as in inflammation, while *softness* indicates the opposite extreme, as in the debility after fever or inflammation, or in many other states, where the nervous system is somewhat exhausted. There are many other conditions of the pulse recognised by physicians; but the above are sufficient for the domestic observance of disease.

PULSE, Frequent, full, and soft.—This state of the heart and arteries (made up of a frequent beat of the heart, a large quantity of blood, and a want of contractile power or *tone* in the arteries), is a *symptom* of the early stages of eruptive fevers and pneumonia.

PULSE, Frequent, full, and hard.—This (which is made up of a frequent action of the heart, with a full amount of blood, and a contractile state of the arteries), occurs in slight plethora and incipient inflammations or congestions; while a more marked form of plethora is indicated, when, in addition to fulness and hardness, instead of the pulse being frequent, it is slow and labouring.

PULSE, Frequent, small in volume, and neither hard nor soft, is the usual condition of the circulation in phthisis and anæmia, as well as in many of the ordinary conditions of females, and those males not remarkable for masculine forms and constitutions.

PULSE, Slow, full, and hard (made up by an infrequent action of the heart, a full supply of blood, and a contractile state of the arteries), occurs as a symptom of apoplexy, and some other conditions of the brain in which congestion is present, as in narcotism, compression, &c.

PULSE, Irregular or intermittent.—This, when *constant*, is a sign of organic disease, but when only occasional may be due to functional disturbance of the heart, either in its supply of blood, or of its usual nervous energy.

PULSE, State of, in children, 271.

PUMP, Stomach, use of, 507.

PUNCTURED WOUNDS, Treatment of, 398.

PUPIL.—See *Eye*.

PURGATIVES (called also *Cathartics*, *Aperients*, and *Laxatives*), 191, 346, 347.

PURPURA (sometimes also called the *Purples* and *Scurvy*) is a disease in which there is a great tendency to the giving way of the small vessels in the form of small red or purple patches just beneath the cuticle. It shows itself in two different forms, known as (*a*) common purpura, or *land-scurvy*, and (*b*) nautical purpura, or *sea-scurvy*.

(*a*) *Land-scurvy* is marked by the occurrence of these purple or dark red patches on the surface of the body, generally first shewn on the legs and thighs. There is also frequently hemorrhage from the gums and nostrils, and often into the textures of the muscles. The pulse is feeble, and there is more or less fever. The *treatment* consists in giving bark and the mineral acids, with a free use of fresh meat and vegetables, and also malt liquor.

(*b*) *Sea-scurvy* resembles the above form, but often in an aggravated degree. The depression of the system is extreme, wounds refuse to heal, and old ones break out afresh. Bleeding from the gums, nose, mouth, and bowels is almost always present, and death takes place from exhaustion. It is caused by a long continuance of salt provisions, without

vegetables. The *treatment* consists in the free use of vegetables, or if they cannot be procured, of lemon-juice, malt-liquor, sugar, tea, or coffee, and potatoes. The strength may also be supported by bark or quinine, with the addition of the mineral acids (see *Tonics*, 341).

PURULENT.—Belonging to *pus*.

PUS (*matter*), Nature and cause of, 42, 43.

PUSTULE, Nature and varieties of, 66.

PUSTULAR ERUPTIONS, Symptoms of, 66 *et seq.*—as acne, 66; sycosis, 67; porrigo, 67, 68; impetigo, 69; ecthyma, *ib.*; boils and carbuncles, 70.

PUSTULAR ERUPTIONS, Treatment of, in children, 313, 314—as porrigo, 313; impetigo, 314; in adults, 386 *et seq.*—as acne, 386, 387; ecthyma, 388; boils, *ib.*; carbuncle, 389.

PUTREFACTION is the commencing decomposition of organized bodies when deprived of life, accelerated by heat and moisture, and retarded by cold, dryness, and the presence of certain substances called antiseptics. See also *Fermentation.*

PYLORUS.—The lower opening of the stomach into the duodenum, guarded by a circular muscle or valve capable of opening or closing it against the passage of the food, and lined with a sensitive mucous membrane, which appears to possess a discriminating or selecting power, so that it allows only digested food to pass, in a state of health. When long accustomed to the presence of improper food, it permits half-digested particles to pass, and in most cases does not interfere to arrest the passage of inoffensive, but undigested, substances, such as the skin of fruits, &c. See *Alimentary Canal.*

PYROLIGNEOUS ACID is either *pure* or *impure*. Both are obtained by the destructive distillation of wood; but the latter is the first liquid which comes over, containing also empyreumatic oil, which gives it a strong flavour of smoke. When again rectified, it makes the purified acid, which is commonly used as one of the varieties of distilled vinegar.

PYROSIS (*water-brash*), Symptoms of, 156; treatment of, 484.

QUACKERY, Nature of, 184; compared with empiricism, *ib.*; gullibility of the public with regard to, 214.

QUARANTINE LAWS.—In order to prevent the introduction of plague and other highly contagious diseases, laws are established, by which it is provided that persons coming from a country in which any such disease prevails shall be isolated in a house provided for the purpose for a certain number of days, which were originally always forty, whence the name has been derived. At present the time varies according to circumstances.

QUARTAN.—See *Ague*, 27.

QUASSIA.—The wood of *quassia excelsa*, a West Indian tree. It is a strong bitter, and active stomachic.

QUASSIA, Infusion of, 235.

QUICKENING.—See *Pregnancy.*

QUICK-LIME.—Recently burnt lime. See article *Lime.*

QUINCE SEEDS (*the seeds of the common quince*), Decoction of, 233.

QUININE, Sulphate of, 242; tincture of, 245.

QUINSEY, Nature of, 108; treatment of, 453.

QUOTIDIAN.—See *Ague*, 27.

RABIES.—See *Hydrophobia.*

RADISH.—See *Vegetables.*

RADIUS (*one of the bones of the fore-arm*), Treatment of fracture of, 434.

RANULA, Nature of, 165; treatment of, 335, 491.

RASHES, Nature of, 58; varieties of, 31, 58 *et seq.*—as small-pox, 31; cow-pox, 33; chicken-pox, 37; measles, 38; scarlet fever, 38, 39; plague, 39; miliary fever, *ib.*; erythema, 59; erysipelas, 59, 60; rose-rash, 61; nettle-rash, *ib.*

RASHES, Treatment of, in children, 300, 310; treatment of, in adults, 360, 382.

RASPBERRY.—See *Fruits*.

RASPBERRY VINEGAR AND WATER, as a drink for feverish patients, 250.

RAW COTTON, Use of, 265.

REACTION.—A term used, in medicine, to signify an increased action of the powers of the system after depression. Thus, after the excessive cold of a biting wind, the face burns, and after the depressing effects of a cold fit of ague, comes a reaction in the shape of the hot fit. So also in typhus fever, after the early depressing stage, comes that of *Reaction*, 25.

RECREATION, Necessity for, 11, 12.

RECTUM.—The lowest of the large intestines, ending in the *anus*. See *Alimentary Canal*.

RED-GUM in Infants, nature and treatment of, 279.

RED LEAD, Symptoms of poisoning by, 174; treatment of, 509.

RED PRECIPITATE (*nitric oxide of mercury*)—see *Precipitates*—Symptoms of poisoning by, 173; treatment of, 509.

REFRIGERANTS.—See *Antiphlogistics*, 342.

REGIMEN.—See *Diet*.

RELAXATION.—A term synonymous with *passive congestion*, 41.

RELAXED SORE-THROAT is a state of passive congestion of the pharynx, together with the *uvula* and *tonsils*, in which there is considerable swelling, and *pale red* puffiness of these parts, with an elongation of the *uvula* that is particularly distressing. There is considerable pain and uneasiness, and a constant desire to swallow, owing to the enlargement of the parts giving the muscles the stimulus to swallow which is naturally afforded by a morsel of food. The best remedy is the application of the nitrate of silver, or chloride of zinc, as ordered for *Ulcerated Sore-throat*, 453, or sage gargle.—See *Sage*.

REMEDIES, Classification of, 189.

REMITTENT FEVER, Symptoms of, in the adult, 28; in the infant, 29; treatment of, in the infant, 298; in the adult, 358.

RESOLUTION.—A termination of inflammation in a restoration to health. See *Inflammation*, 367.

RESPIRATION, or *Breathing*, is a process established for the purpose of effecting a change in the blood by its contact with atmospheric air, through the thin capillary vessels in which it is circulated over the walls of the air-cells of the lungs (see *Circulation* and *Heart*). It consists of two acts; one (inspiration), by which the volume of the chest is enlarged, in consequence of the contraction of the diaphragm, and of certain muscles, which raise all the ribs towards the neck; and the other (expiration), which diminishes the capacity of the chest by lowering the ribs, while the abdominal muscles, which are the chief agents, push up the relaxed diaphragm, and thus aid in the same object. Respiration thus carried on may be regular and of the ordinary frequency, or it may be more frequent than usual, or spasmodic, or laborious, otherwise called difficult (*dyspnœa*). Such is the mechanical action of respiration, but the chemical effect is much more complicated and mysterious than the mechanical; for though much has been discovered by Liebig and others, there is still a great deal which is incomprehensible. It will, in the first place, be necessary to remember that the atmospheric air is made up of 21 parts of oxygen to 79 of nitrogen, which is the condition in which it enters the lungs, whilst on its re-appearance it has sustained the following changes—first, it has lost oxygen; secondly, it has received carbon in the form of carbonic acid; thirdly, it has suffered a change in the quantity of nitrogen, varying with the condition of the animal. These changes are intimately connected with the effect upon the blood, which is found at the same time to have gained what the air has lost, and to have given out exactly what the air has gained; and thus it is conclusively ascertained that the air is inspired for this express purpose. The absorbed

oxygen is supposed by Liebig to enter then and there into combination with the carbon, which process he describes as exactly similar to ordinary combustion; but, from other experiments, there is strong reason to believe that the oxygen is absorbed into the blood, and that its union with the carbon takes place in all the parts of the body; the carbonic acid being there generated and contained in the veins until they reach the lungs and skin, where it is given out; so that the combustion is a general one, and animal heat is thus produced in the extremities independently of the warm blood sent them from the heart. But besides this oxygen absorbed for this specific purpose, a still further quantity enters the blood for the purpose of uniting with the sulphur and phosphorus contained in the body, by which they are enabled to combine with other elements, and so to produce the phosphates and sulphates. The carbon which is exhaled from the lungs and skin is of an enormous amount, varying with the exercise taken, and with the temperature of the surrounding air—a great quantity of the former and a low degree of the latter both increasing the exhalation of carbon. By actual experiment it has been found, that a person who, in a state of rest and fasting, excreted 145 grains per hour, after a meal and a walk excreted 190 in the same time. During sleep the same person only excreted 100 grains. It is supposed that an adult male who takes strong exercise will excrete about 10 or 11 oz. per 24 hours; and that those who take little will not lose more than 7 or 8 oz. Assuming 10 oz. as the average, its union with oxygen to form carbonic acid gas will produce 21 cubic feet of that noxious element; so that a man lying in a confined space of 7 feet long by 3 feet wide, will, in the course of 24 hours, discharge from his person enough carbonic acid gas to fill this space one foot high. The examination of the nitrogen which is given off or absorbed is not of so much importance to our present subject, especially as little is known of its effects; but it is found that animals well fed and in health increase the nitrogen already existing in the air, whilst those which are badly fed absorb it, and consequently diminish its amount; thus, in all hybernating animals, nitrogen and oxygen are actually absorbed to a much greater extent than they exhale carbon; and hence they do not lose weight during the period of their long sleep. The following table shows the difference of the proportions of these elements in the two states of the blood:—

	Arterial Blood.	Venous Blood.
Carbonic acid .	62.3	71·6
Oxygen	23·2	15·3
Nitrogen	14·5	13·1
Total	100·0	100·0

Thus, it would appear that the quantity of nitrogen is very nearly the same in both conditions of the blood; whilst about one-third of the free oxygen of the arterial blood disappears during its circulation and passage into the veins, and is replaced by an equivalent amount of carbonic acid. The converse of this takes place in the capillary vessels of the pulmonary vessels, where this same amount of carbonic acid is set free and replaced by oxygen.

RESPIRATION, Various states of, as symptoms of disease. See *Breath* and *Breathing*.

RESPIRATOR.—Several little machines have lately been invented, by which the air is warmed before it is drawn into the lungs, by the heat which has been given out during the act of expiration. The principle is old enough, being the same as is acted on when we draw a warm woollen comforter over the mouth in a cold day, or when a lady pulls her veil down over her face. But

Mr. Jeffrey's respirator was the first in which layers of fine metal wire were made to effect this same purpose; and they are a most efficient improvement upon the woollen material, because they do not absorb the moisture as the wool does. They have not yet been improved upon in quality, and scarcely even in cost, as they are made and sold at a very low price, though of inferior metal, and not equal to the more elegant and clean material which is employed in those intended for the higher classes. Respirators, though a great comfort to the confirmed invalid, should not lightly be used, as they afterwards render the lungs much more susceptible of cold when they are omitted.

RETE MUCOSUM.—The internal layer of the *cuticle*, 45.

RETINA.—The expansion of the optic nerve within the eye. See *Eye*.

RHEUMATISM, Nature and symptoms of, 88; treatment of, 416.

RHEUMATIC HEADACHE, Symp-of, 126; treatment of, 463.

RHUBARB, Properties of, 243; pill of, 241; infusion of, 235; tincture of, 245; and magnesia, 268.

RHUBARB SHERBET, Receipt for, 250.

RHUBARB, Stalks of.—These are used in cookery as a substitute for fruit in making puddings, &c., and are very wholesome for children. See *Vegetables*.

RIBS are twelve in number on each side, and are long, curved, and flat bones attached, behind, to the bodies of the bones of the spine by a joint, as well as by a ligamentous band, to their lateral processes. The seven superior ribs are each attached to the breast-bone, with the intervention of a piece of cartilage of the same form as the ribs, and acting as a continuation of them. The next three are also attached, but by the intervention of the seventh rib, with the cartilage of which theirs is joined, while the two last, called *floating ribs*, stand out alone. See *Skeleton*.

RIBS, Treatment of fracture of, 440.

RICE contains a large proportion of starch and gummy matters, but very little of the nitrogenized compounds and oily matter, as compared with the cereal products which are described under the article *Flour*. It is, therefore, only for certain purposes that this grain is useful—as, for instance, to produce fat; and as it has a tendency to constipate the bowels, it is much employed when there is a predisposition to diarrhœa. As obtained by mere thrashing and dressing the grain from the straw, rice is covered with a thin husk, and is then known as *paddy* in the rice-growing countries. It is here always deprived of this husk, though often imported in it, and in this state it forms that well-known article *rice*, which is ordinarily distinguished as *Carolina rice* when of the best quality imported from America, and *Patna* when the produce of the East Indies. These grains are ground, and then known as *rice flour*, or *ground-rice*, which is only used for making puddings. For even if rice is adopted as a cheap addition to flour for making bread, it is boiled *whole*, and not in a ground state.

RICE GRUEL suited for Infants, 284.

RICE MILK for Children, 291.

RICE PORRIDGE for Children, 291.

RICE PUDDINGS for Children, 284; plain, 293; baked, *ib.*; ground-rice, *ib.*

RICE WATER, Receipt for, 249.

RICKETS is a disease common among children, in which the bones, from a deficiency of earthy matter, are too soft and yielding, and bend under the weight of the body (see *Scrofula*, 139). The treatment is to be conducted on the same principle in all cases, as *Scrofula*, 323 (*a*), with the addition of extra precautions where the spine is affected. See *Spinal Disease*, 327.

RIGOR, or *Shivering*. — A sudden sensation of cold, accompanied with shivering, which is a symptom of approaching fever, or of the formation of pus, or of the passage of a gall-stone, or sometimes making its appearance in the early stages of labour. Indeed, it may be said to indicate the approach of almost all the serious *acute* diseases of the body.

RING-FIXED.—When a ring is fixed on the finger from the swelling of the skin or joint, rub the finger with soap and *cold* water, and it will then generally admit of its removal. If this fails, take a strong thread or piece of fine twine, and beginning at the end of the finger, wind it regularly round and round it, with the coils close together, till the ring is reached; then slip the end through the ring from the side next the end of the finger, and begin to unwind the string, which, as it progresses, carries the ring with it. Sometimes, however, when the finger is very much swollen, and when the ring is deeply embedded, even this plan will not succeed, and the only resource is to cut through the ring with a pair of cutting-pliers, first slipping under it a thin piece of metal or card-board to protect the skin from injury.

RING-WORM.—See *Herpes Circinnatus*, 62; treatment of, 311.

ROCHELLE SALTS (*tartrate of soda and potass*).—A gentle aperient now seldom used.

ROLLER.—See *Bandages*, 265.

ROSE-RASH (*roseola*), Symptoms of, 61; treatment of, in children, 310; in the adult, 384.

ROSE-LEAVES are the dried petals of the red or damask rose.

ROSES, Confection of, 231; infusion of, 235.

ROSE-WATER is distilled from water in which fresh rose-leaves are steeped. It is only serviceable as a pleasant vehicle for more powerful remedies.

ROUND-WORM.—See *Worms*, 157.

RUBEFACIENTS.—Any application which reddens the skin is so called.

RUE.—This common herb is now seldom used by regular practitioners of medicine, though its efficacy is not denied as an antispasmodic and stimulant. Rue-tea is a very common domestic remedy in flatulent colic, also in worms, amenorrhœa, and general debility of children.

RUM.—See *Fermented Liquors*.

RUPIA, Symptoms of, 66; treatment of, 386.

RUPTURE, Symptoms and treatment of, 426.

RUSKS as suited for Infants, 284.

SACCHARINE.—Relating to *sugar* (*saccharum*).

SACRUM.—The lowest part of the *spine*, forming also the back of the *pelvis*. See *Skeleton*.

SAFFRON, Properties of, 243.

SAGE (*the common garden herb*), is a powerful but stimulant astringent. It is sometimes given in the form of sage-tea as a carminative; but the tea is chiefly employed mixed with a quarter of its bulk of vinegar in *relaxed sore-throat*.

SAGO, like arrowroot, is a kind of starch, the produce of the *sagus farinifera*, an Indian palm, of which it is the pith, washed to deprive it of its cellular tissue. In order to convert the paste, resulting from its admixture with water, into the round granules in which it is imported into this country, the pulpy matter, when half dry, is forced through a perforated plate, and then rubbed into little balls. Its low price makes it very useful as food for invalids, and prevents any great fraud in substituting any other farina for it.

SAGO MILK, Preparation of, 291.

SAGO PUDDING, Preparation of, 293.

ST. ANTHONY'S FIRE.—The popular name for *erysipelas*.

ST. VITUS' DANCE.—The popular name for *chorea*.

SALADS.—These cool and pleasant accompaniments to our usual diet are particularly wholesome to a strong and hearty person, but are incapable of digestion by a weak stomach, and either remain in it until they are rejected by vomiting, or pass off unchanged, irritating the bowels and causing diarrhœa. The addition of salad-dressing is supposed to make salads more digestible; but this is very doubtful, and, in fact, stomachs vary so much in their powers, and in their likes and dislikes, that no rule can be laid down on the subject.

Here, as in most similar cases, experience is the best guide. See *Vegetables*.

SALICINE.—The active principle of the willow, which has been supposed to be a good substitute for quinine in relieving intermittent and other fevers; but though a tonic, it has little or no specific power over *ague* and *neuralgia*.

SALINES.—Medicines containing solutions of neutral salts are so called.

SALIVA.—The fluid secreted by the salivary glands, and of great importance in *Digestion*, 153; see also 98.

SALIVARY GLANDS, Use and structure of, 96; inflammation of the, 107; treatment of, 319, 452.

SALIVATION.—See *Ptyalism*.

SALMON.—See *Fish*.

SAL-PRUNELLE. — Nitre or saltpetre fused and cast into circular moulds. It is used for relaxed and inflamed sore throats by allowing a ball to dissolve slowly in the mouth; but it is in no way superior to ordinary nitre.

SAL-VOLATILE (*aromatic spirit of ammonia*), 243.

SALT.—This term is applied to the various neutral compounds of alkalies, &c., with acids. *Common salt* is the chloride of sodium, and is extensively used as a condiment with our various kinds of animal food, as well as for preserving them from decay or putrefaction. By a reference to the *Composition of the Blood*, it will be seen that every thousand grains of that fluid contain four of chloride of sodium and potassium, so that salt in some form is largely required, especially when it is considered that it is also constantly secreted with the *urine*, *perspiration*, *fæces*, &c. Children should therefore be encouraged to eat salt in liberal quantities. Salt also appears to prevent the formation of worms, and in large doses is sometimes given as a worm-medicine, though not much to be relied on. Dissolved in warm water, a tablespoonful of salt is a powerful emetic, which may at times be adopted with advantage in cases of emergency.

SALT MEAT is much used as an article of diet in this country, from the fact that salt, whether in substance or in solution, prevents the decomposition of animal substances at a temperature below 60 or 65 degrees; but above that heat it loses its effect, and the tendency to putrefaction is very little controlled by it. Salt does not change the colour of flesh to any great extent, but makes it more pale by the discharge of the blood which it contains. In using salt the great point is to cause it to enter the interior, and to take care that the article to be salted is not raised in temperature above 55 or 60 degrees. In addition to salt, *nitre* is much used, which has a similar effect to common salt; but it hardens the fibre more, and reddens it very considerably. Sugar or treacle is likewise employed, being without this hardening tendency, and seeming to act by virtue of its large proportion of carbon, and this last by its power of absorbing oxygen, which is the great promoter of decomposition. *Salt provisions* of all kinds should only occasionally be introduced on the table, as they have lost a great part of their nourishing materials, including especially the other salts of the blood, besides chloride of sodium which are dissolved in the brine and exchanged for it. Salt meat is also harder and more indigestible than fresh, so that on all account it is not to be recommended for the invalid, and except as an agreeable variety for strong stomachs, it should be avoided.

SALT-PETRE.—See *Nitrate of Potass*.

SALT AND SPICES not required by infants, 293.

SALT OF LEMONS, and *Salt of Sorrel*, symptoms of poisoning by, 172; treatment of, 508.

SANDWICHES, Toast, for invalids, 247.

SANITORY. — Relating to health. This term is now constantly used in reference to regulations for *drainage*, *cleanliness*, *ventilation*, *&c*. See those articles

SARDONIC SMILE.—See *Laughter*.

SARSAPARILLA. — Decoction of, 233; liquid extract of, 234.

SAVINE. — The tops of *juniperus sabina* (an evergreen, small, bushy shrub) are used in medicine chiefly as an external stimulant to the skin in the shape of *savine ointment*, 239. Savine is also a powerful stimulant to the uterine organs, and is employed in amenorrhœa, where there is torpidity of the secreting function. It is, however, too powerful to be used in ordinary cases. It is also made use of for criminally producing abortion. See *Poisoning by Savine*, 175.

SAVINE, Symptoms of poisoning by, 174; treatment of, 510.

SCABIES (*psora*, or *itch*), Symptoms of, 64, 65; treatment of, 312.

SCALDS, Treatment of, 400, 403.

SCALL'D HEAD (*porrigo*), Symptoms of, 67; treatment of, 313.

SCALP.—The skin covering the head. It is the seat of various eruptions. See *Ring-worm*, *Eczema Capitis*, *Scall'd Head*, *Dandriff*, and *Impetigo;* also *Encysted Tumours* (see article on that subject). From the frequently unprotected condition of the head, the scalp is liable to cut and lacerated wounds, which should be treated with great care, as if inflammation is established, it is very apt to extend to the brain. See *Wounds*, 395 *et seq.*

SCALES (*squamæ*), Nature of, 71.

SCALY ERUPTIONS, Varieties of, 71; treatment of, 389.

SCAMMONY (*the gum resin obtained from convolvulus scammonia*).—The best is imported in masses weighing from two ounces to half a pound each, of an ash-grey colour, with a resinous fracture of a dark greenish colour. It is, however, greatly adulterated, and is seldom sold of the above quality. When pure, it is a powerful cathartic, and has been much used for children, especially in removing worms, but is too active and drastic to be often given with safety. The dose for the adult is eight or ten grains. For the child a *compound powder of scammony* is generally employed, made as follows:—" Scammony and hard extract of jalap, of each two ounces; ginger, half an ounce. Rub separately to a fine powder, and mix." The dose of this for an adult is from ten to twenty grains, for a child according to age. See *Tables*, 222.

SCAPULA.—The shoulder-blade. See *Skeleton.*

SCAPULA, Treatment of fracture of, 435.

SCARF-SKIN (*cuticle* or *epidermis*), Structure of, 45.

SCARIFICATIONS are short and shallow incisions, sometimes made with a lancet to allow of slight bleeding from the superficial vessels, as in *ophthalmia*, *erysipelas*, &c. They are also made with a proper instrument in *cupping.*

SCARLATINA, or *Scarlet Fever*, Symptoms of, 38, 39; sequels of, 39; treatment of, in children, 300; in adults, 362.

SCHEEL'S Emerald Green, Symptoms of poisoning by, 174; treatment of poisoning by, 509.

SCIATICA, Symptoms of, 129; treatment of, 466.

SCIRRHUS (*hard cancer*), Nature of, 160; treatment of, 487.

SCLEROTIC COAT OF THE EYE, Structure of, see *Eye;* symptoms of rheumatic inflammation of, 163; treatment of, 490.

SCROFULA, Nature and causes of, 133 *et seq.*—as scrofulous ulcers, 138; disease of the lymphatic glands, *ib.*; disease of the bones and joints, *ib.*; psoas and lumbar abscess, 139; spinal diseases, including curvature from rickets, and from weakness of the muscles and ligaments, *ib.*; from caries, 140.

SCROFULA, Treatment of, in children, 322 *et seq.*—as the scrofulous constitution, 323; enlargement of the external glands, 324; diseased mesenteric glands, 325; disease of the joints, 326; abscesses, 327; spinal disease, 327, 328; of scrofula in the adult, appearing as tubercular consumption, 470, 472; as tubercles in the brain, 473.

SCROFULOUS CONSTITUTION, Indications of, 134; treatment of, 323.

SCROTUM.—The skin covering the testicles.

SCURF OF THE HEAD (*dandriff*), Symptoms of, 71; treatment of, 390.

SCURVY (*Land* and *Sea*).—See article *Purpura*.

SCYBALÆ. — Hard and impacted lumps of *fæces*, which have been lodged in the folds or cells of the colon for some time, and generally cause irritation by their prolonged retention. See *Diarrhœa*.

SEA-BATHING, 255.

SEA-SICKNESS, Treatment of, 513, 514.

SEA-VOYAGES, Management of the disorders incidental to, 513.

SEBACEOUS GLANDS.—See *Skin*, 46, and *Acne*, 66.

SECONDARY SYMPTOMS.—A term generally applied to symptoms which make their appearance at an interval from the first or *primary* appearance of *syphilis*; the consideration of which, for various reasons, is omitted here.

SECUNDINES.—The after-birth and membranes thrown off by the womb when the child is born.

SEDATIVES, 190; use of, 344.

SEIDLITZ POWDERS are effervescent saline aperients, which are made and sold according to various receipts. All contain bicarbonate of soda in one powder, and tartaric acid in the other; but to the former of these is added sometimes two drachms of Rochelle salts, sometimes one or two drachms of Glauber's salts, but usually from one drachm to two drachms of Epsom salts, in which last case they are sufficiently aperient for many constitutions. As an habitual aperient they are useless, as they soon cease to act; and for those cases where an active clearing out is desired, they are also inefficient; but for slight derangements of the stomach and bowels, especially if not too frequently had recourse to, they are mild and tolerably harmless. Those who fly to a Seidlitz powder to get rid of a liberal dinner of fish, flesh, fowl, and *wine*, are soon convinced of their error by the occurrence of flatulent dyspepsia.

SEIDLITZ WATERS.—The natural waters of Seidlitz. See *Waters, Mineral*.

SELTZER WATER.—See *Waters, Mineral*.

SELTZER WATER, Artificial, is made as follows:—Muriate of lime and muriate of magnesia, of each four grains; dissolve them in a small quantity of water, and add to it a similar quantity of water containing dissolved in it eight grains of bicarbonate of soda, twenty grains of chloride of sodium, and two grains of phosphate of soda; mix and add a quarter of a grain of sulphate of iron; then pour into a pint bottle and force in carbonic acid with the proper machine.

SEMOLA is prepared from the very finest wheat, by making flour into a thick paste with distilled water, washing out the whole of the *starch*, and then adding to the gluten its own weight of pure flower. The paste of gluten and flour is then dried at a temperature not exceeding 150° Fahrenheit, and granulated. It is useful in those cases where an excess of gluten is desirable, and is prepared and sold by Messrs. Perrins and Barnitt, Conduit Street. It softens by boiling, but is not perfectly soluble in water.

SEMOLINA is also a preparation from wheat flower by removing part of its starch, but differs somewhat from *semola* in its mode of preparation. Like that article it is chiefly composed of the gluten of wheat, mixed with a small quantity of starch, and converted by art into small round grains resembling sago; yet it is more angular in the shape of its granules than that well-known article. Both semolina and semola are very nourishing, and less constipating than ordinary wheat flour.

SEMOLINA, Preparation of, for infants, 284.

SEMOLINA PUDDING, 293.

SENNA LEAVES, Properties of, 243.

SENNA, Confection of, 231; infusion of, 236; sweet essence of, 268.

SENSATION.—See *Nervous System.*

SENSIBILITY.—See *Nervous System.*

SEROUS MEMBRANES, Structure of, 77; congestion and inflammation of, *ib.*; symptoms of inflammation of the serous membrane of the brain, 79; of the chest, *ib.*; of the peritoneum, 81; of the synovial capsules, 84.

SEROUS MEMBRANES, Treatment of inflammation of, in children, 315; in the adult, 409 *et seq.*

SERUM.—See *Blood;* also *Inflammation of Serous Membranes*, 77.

SETONS, Use and method of introducing, 262, 263.

SEX, Influence of, on disease, 3.

SHAMPOOING.—A mechanical treatment of disease by kneading, friction, &c. It is comprehended in *Kinesipathy*, which see.

SHELL-FISH (see *Fish*), Symptoms of poisoning by, 175; treatment of, 510.

SHERRY.—See *Wines.*

SHINGLES (*herpes zoster*), Symptoms of, 62; treatment of, 311.

SHIVERING (*rigor*).—See article *Rigor.*

SHOCK.—The effect produced on the nervous system by any violent accident or mental emotion, either joyous or the reverse. It is generally injurious, but in certain conditions of the nerves and brain, such as is sometimes seen in mania, a severe mental or bodily shock will restore the patient instantly to health.

SHORT-SIGHT, Nature of, 163; treatment of, 333.

SHOULDER, Treatment of dislocations of the, 423.

SHOULDER-BLADE (*scapula*).—See *Skeleton.*

SHOULDER-BLADE, Treatment of fracture of, 435.

SHOULDER-JOINT.—This part is made up of the articulating surface of the shoulder-blade, with its protecting processes, the *acromion* and *coracoid* (see *Skeleton*), and the upper end of the arm-bone. The ligament is merely capsular, and the sole prevention to dislocation lies in the muscles and tendons which surround the joint, which is of the ball-and-socket kind. See *Joints.*

SIALOGOGUES.—A class of eliminant medicines, 191.

SICKNESS, or *Vomiting*, is an inverted action of the stomach, generally preceded by *nausea*, which is a tendency to it or a premonitory feeling of its approach. It is sometimes a natural effort to get rid of some offending matters from the stomach, then popularly called "*foul sickness;*" or it may be the consequence of inflammation (*gastritis*); or it may be a natural effort to relieve a congested liver; or, lastly, it may be of a character called nervous, by which is meant that the exact cause is wrapped in obscurity. *Nausea* has a most depressing effect upon the heart and arteries, and also relaxes the muscles and the skin. It is generally attended with a cold perspiration, and hence nauseants are employed as *diaphoretics*. When sickness is produced artificially, the full effect is said to be that of an *emetic;* while the slight degree is called *nauseating*, and produced by a *nauseant.*

SICKNESS of Pregnancy, Treatment of, 496, 497.

SICKNESS, Sea, treatment of, 513.

SICK-HEADACHE, Treatment of, 464 (*c*).

SICK-ROOM, Management of the, 337 *et seq.*

SIDE, Pain in the.—See *Pleurodynia.*

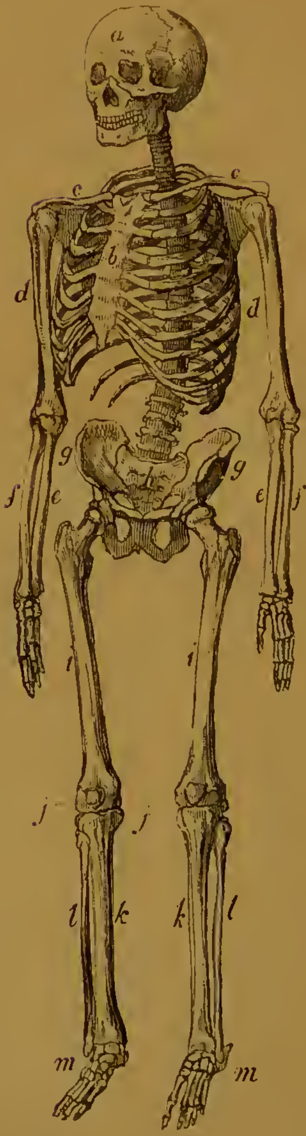
SIGHT.—See *Eye, Anatomy of.*

SILVER, Nitrate of, 243. See also *Caustics.*

SINAPISM.—A mustard poultice, 264.

SINKING (see *Collapse*).—A slight sensation of sinking at the stomach is often a symptom of *indigestion.*

SKELETON.—The bony frame-work of the body, upon which, by means of the various levers it affords, the muscles act, and thus effect the several motions which are continually carried on. The skeleton is divided into two portions—one forming cavities for containing the vital organs, and protecting them from danger; and the other consisting of central supports adapted to the purposes of locomotion, by offering levers to be worked by the



DIGARAM OF THE SKELETON.

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various muscles. The bony cavities are—first, the cranium and spinal column; secondly, the thorax or chest, attached to the middle of the spine; and thirdly, the pelvis, terminating it. The bony organs of locomotion are the four extremities of the body.

(*a*) *The cranium, or skull* (see *Diagram of the Human Skeleton*, *a*), consists of eight bones—namely, the frontal, occipital, two temporal, two parietal, sphenoid, and œthmoid bones. The bones of the face, which are generally reckoned as part of the skull, include the two nasal, two superior maxillary, two lachrymal, two molar, two palate, two inferior turbinated, one vomer, and the bone of the lower jaw. These bones of the face are developed into several cavities, two of which are called the orbits, and contain the eyes; two close together, form the nostrils (see *Nose*); one between the upper and lower jaw-bones, the mouth; and one on each side for the ears, which last part also contains four little delicate bones for communicating the vibrations of the air to the nerve of hearing (see *Ear*). In the jaws, also, there are fixed two rows of teeth, the upper and the under, each consisting of—first, the incisors, being more or less cutting nippers, and placed in front; secondly, the canine, pointed and intended for holding or tearing; and thirdly, the molars for grinding. See *Teeth*, 297.

(*b*) *The spinal column* consists of a series of bones united together by an elastic material, called the intervertebral substance, and by ligaments also as well as by muscles. Each bone is pierced by a large hole for the lodgment of the spinal cord, and by lesser notches or holes for the transmission of the nerves, a pair of which leave the cord opposite each separate bone. Besides the body and the holes (or *foramina*, as they are scientifically called), each vertebra consists of a spinous process or projection, backwards or downwards as the case may be, and of another process or projection on each side, called the lateral process—all of which are intended to secure these bones together, and to give attachment and leverage to the muscles which bend the spine. To the skull the spinal column is attached by a very peculiar universal hinge-like joint, in such a way that it can be turned in all directions. This in man is very complicated, so as to allow him not only to bend it in all directions, but also to rotate it; whilst in the lower animals it is strengthened by strong bony projections, so as to support the weight of the head when extended horizontally. The first seven of these bones form the neck; the next twelve in man have a rib attached to each, or to the intervertebral substance of each, and constitute the vertebræ of the back. Behind or below these are the vertebræ of the loins, which are five in man, and like those of the neck are free, whilst the last of these lumbar vertebræ is firmly attached in the same way as the others to a corresponding surface of the sacrum (*h*), which forms a part of the pelvis (*g g*), and answers to the spinal column, containing within it a similar canal, which receives the continuation of the spinal cord in the shape of a bundle of nerves, called in anatomy *cauda equina.* Beyond the sacrum, again, are the *ossa coccygis*, rudimentary in man, but extending to a number of bones in the lower animals.

(*c*) *The thorax, or chest* (*b*), is formed by the vertebræ of the back and the ribs attached to them, which correspond in number. Each of these is firmly attached by two joints, one at the end to the intervertebral substance, the other to a lateral process, by means of a tubercle, a short distance from the first. Towards the other extremity the rib becomes flattened, and in its general outline is bent to an irregular segment of a circle, so that the two sides form an arch more or less of an oval section. Each rib ends by uniting with a piece of cartilage, which in the first seven or eight is directly attached to the sternum, or breast-bone, and in the remainder indirectly through those next to them. The *sternum* consists of a series of spongy bones, consisting of three in man, which receive the cartilages, and, with the ribs and the vertebræ of the back, combine to form the chest. This cavity contains the lungs, the heart, and the great vessels, separated from the abdomen by the diaphragm, which is a thin partition of muscle and tendon stretched across so as to form an arch, with the convexity upwards, and a concavity below, against which lie the liver and stomach, also within the protection of the lower ribs. See *Diaphragm.*

(*d*) *The pelvis* (*g h g*) consists of an imperfect circle of strong spongy bone, which is made up of the sacrum and ossa coccygis, or tail-bones, above; and of three bones on each side firmly united together, called the ileum, the ischium, and the pubes. These together constitute an irregular ring, protecting the bladder and the organs of reproduction, and also giving a firm support to the legs. In man the wings of the ileum are much expanded, and serve to support the intestines, or in the pregnancy of the female, the gravid uterus.

(*e*) *The legs* of man are attached to the pelvis by means of a ball-and-socket joint, the thigh-bone being deeply imbedded in a cup-like cavity of the pelvis called the *acetabulum.* This is a very strong joint, but it is liable to be dislocated, and is very difficult of reduction. The leg consists of four portions, which in anatomy have received the names of the *femur* (*i*), *patella* (*j*), *tibia* and *fibula* (*k l*), *tarsus* and *metatarsus* (*m*); but in common language different names have been given them which has created considerable confusion.

(*f*) *The femur*, in common language called the *thigh* in man, is a long and strong bone, beginning with a smooth ball, which is deeply let into the cup of the pelvis, and is united to it by a narrow part of the bone called the neck. It has near it a strong rough process which stands out from it at a considerable angle, and is called the trochanter major, being the part felt projecting opposite the hip-joint, and often called the hip itself, though that name more properly belongs to the crest or ridge of the ileum. Towards the lower end, the thigh-bone enlarges and forms a smooth surface covered with cartilage, and extending to nearly three-fourths of a circle from before backwards. This smooth surface is attached by strong ligaments to the tibia below, and has playing upon it in front a bone called the patella in anatomy, or in common language the *knee-cap* in man. The joint itself is the *knee* in man, and is liable to accidents, or to inflammations of a serious character, and is frequently the seat of lameness.

(*g*) *The tibia*, called in man the *leg bone*, extends from the knee to the ankle. It is supported by a smaller bone on the outside (the fibula), which is lost sight of in common language, and has received no distinctive appellation. In man this bone forms a part of the ankle-joint, but in the domestic animals the hock-joint, which corresponds to the ankle of man, is composed of the tibia alone, as regards its upper boundary; whilst below, in all cases, it is made up by the upper bone of the tarsus—namely, the astragalus.

(*h*) *Tarsus and metatarsus.*—The tarsus consists of seven bones only, the tibia being articulated with it at about one-half of the length from the hinder end, and by a cartilaginous surface composed of three sides; there is also a projecting bone (the *os calcis*), which affords leverage to the strong muscles of the tibia and femur, ending in a tendon which is called the *tendo Achillis.* These bones are united together into a strong whole by ligaments and intervening cartilage, which take off the jar that would otherwise be communicated to the body when the springs and falls are sustained which we are all subject to. Below the tarsus are the metatarsal bones, five in number, which support the five toes.

(*i*) *The upper extremity* of man corresponds with the fore-leg of the lower animals, but differs still more than is the case with the other extremity, which is chiefly used by man in progressing, though in a different position to that of the dog and horse, he being a biped. But with the limb we are now considering, a hundred different actions are to be performed—ropes are to be pulled down, or up, or straight towards the body; large and small substances are to be grasped in the arms; hammers are to be wielded with terrific force, or with all the delicacy necessary for riveting the fine mechanism of a watch, besides the multifarious movements of a similar character; and in addition to all these motions requiring the whole limb, there are others depending upon the fore-arm alone, in which man shows his superiority to the animals beneath him. If any of these has a wound in the sole of his foot, he is obliged to lie down and forcibly push it sideways against the ground, while he bends the foot, in order that he may get at it with his tongue. Man, on the other hand, can readily turn his palm upwards, and at once detect the mischief, if any there be. In other words, *man can pronate and supinate his hand*, a gift of immeasureable importance to him, though one which he shares with all the higher genera of the monkey tribe. By this power he can turn any object about as he fashions it to his purpose, and can with the greatest ease do that which the otherwise intelligent dog is incapable of effecting. Hence, we find that throughout the whole extremity, although the same bones are made subsidiary to this new purpose, yet they are widely different in their joints, and also vary in general form. Nevertheless, all have a *shoulder-blade*, a *humerus* (*d*), a *radius* and *ulna* (*e f*), and a *carpus* and a *metacarpus*. Man, also, has a *collar-bone* (*c*), by which the shoulder-blade is attached to the breast-bone, and is thus rendered more completely a fixed point for the various operations, often antagonistic to each other, which his wants demand.

(*j*) *The shoulder-blade* is a triangular flat bone, with a ridge dividing its external surface into two parts. In all there is a shallow cup which receives the head of the humerus, and forms with it the *shoulder-joint*, where are two projecting points of bone, the *acromion* and *caracoid processes*, to which the outer extremity of the *collar-bone* is firmly united by strong ligaments, the other end being still more securely confined to the breast-bone by a thick intervening cartilage and additional ligaments. Here there is a strong point of dissimilarity with the domestic animals, none of them possessing a collar-bone; but it is not confined to man, since many of the lower animals also possess them—as, for instance, the hare, rabbit, and rat, and, in fact, all the division *rodentia;* most of which, however, require and possess, like him, the power of grasping their food, and can pronate and supinate their fore-arms to a degree almost equal to that with which he is endowed. The shoulder-blade in man does not lie so flat on his sides as in the above animals, its outer aspect looking nearly in the same direction as his spine; whilst in them it looks directly outwards, or very nearly so, the free margins approaching one another more than the joints.

(*k*) *The humerus* or *arm-bone* presents a rounded articular surface at the upper end, a long cylindrical middle, and an oblong smooth ridge covered with cartilage at the other extremity, which forms part of a hinge-like joint, the remainder being made up by the ulna and radius. This bone is called *the arm*, or the *upper arm*, the joint bounding it below being the *elbow-joint.*

(*l*) *The ulna and radius* are articulated to the humerus, so as to form a simple hinge; but in addition, there is another power given to man, to which I have already alluded, and which is carried out by a very simple yet effective contrivance. In him the ulna forms the chief part of the elbow-joint, whilst the radius enters into that of the wrist, and each has a liberty of rotating in its attachment at the opposite end. Thus, the two may be compared to one bone of somewhat greater length, and joined to the elbow and wrist in the usual way, but afterwards divided obliquely from one end to the other in such a way as to leave one joint entire for the wrist, and the other for the elbow. If this were done by a carpenter, and the bones rounded off and attached together by a circle of leather at each end, it would be found that there would be a degree of liberty similar to that which we enjoy, but not quite to so great an extent, which is afforded by the two bones arching out from one another in the middle, and thus enabling the movement to be still more complete. The ulna is the bone chiefly entering into the composition of the elbow-joint; and it, like the ankle, has a process projecting backwards for the purpose of giving leverage to its muscles, which is the *olecranon* in anatomy, or the *point of the elbow* in common language.

(*m*) *The carpus* and *metacarpus.*—The former consists of eight bones, with strong ligaments connecting them together, so as to form one strong whole and a projecting hook-like process standing out, under cover of which the flexor tendons pass behind the wrist, and are securely bound in their places. The lower row of bones is articulated with the five *metacarpal bones*, which spread to form the palm of the hand.

(*n*) *The hand of man* is a complex mechanism, composed of the five metacarpal bones, four of which each carry three phalanges to form the fingers, and the fifth two only for the thumb. These are simple enough in their bony mechanism; but when clothed with their numerous muscles, and furnished with the net-work of vessels and nerves which the sense of touch requires, it is indeed a wonderful and exquisitely delicate machine — capable alike of picking up the most minute speck of sand, or of grasping and wielding the ponderous hammer of the smith.

SKIN, Structure of, 45; symptoms of diseases of, 57 *et seq.*; treatment of diseases of, in children, 307 *et seq.*; general principles of treatment of, in the adult, 369; treatment of special skin diseases in the adult, 381 *et seq.*

SKIN-BOUND INFANTS, Treatment of, 279.

SKULL.—See *Skeleton.*

SKULL, Treatment of fractures of the, 440.

SLEEP.—This condition of the nervous system is remarkable for the fact, that part of it is dormant while the remainder is in full activity, and the extent of the abeyance varies in proportion to the degree of sleep. Thus, in profound sleep, the functions of the *spinal cord* and *medulla oblongata*, by which the reflex actions are carried on, are alone in a state of activity—the organs of the mind and senses being completely torpid. But in less profound sleep, actions depending upon one sensation are often performed; and we turn in our beds when in an uneasy position, or put our hands to ear if tickled, although we are not afterwards conscious of having done so. In *dreaming* and *nightmare*, it appears as if the organs of the mind were partially active, a train of thought being often suggested by some external impression, which is afterwards carried on without any control, either of time or space. So also in *somnambulism*, or sleep-walking as it is sometimes called, impressions are made upon all the senses, which are acted on and lead to results; but these are not influenced by any of the ordinary corrective or superintending faculties, such as fear or caution, and run riot in the most remarkable manner. The sleep of the body is a rest from all muscular exertions; and it may be taken without mental rest, so that in some constitutions, so long as the muscles are not very much used, a very limited extent of sleep may suffice. Instances are recorded of persons in sound health abstaining from sleep for several successive days; and I have myself known four nights and days passed in card-playing without a moment's interval more than was necessary for satisfying the exigencies of the appetite and its attendant wants. Seven or eight hours may perhaps be taken as the lowest average amount of bed which will serve to keep a person of middle age in good health, who keeps his body and mind actively employed during the remaining portion of the twenty-four hours; and this is, perhaps, considerably less than the usual amount taken, which indeed, is generally increased in proportion to the lazy habits of the individual during the day. Nevertheless, I am persuaded that life is shortened, and the machine sooner worn out if the attempt is made to reduce the allowance below the number of hours specified above; and though it may be carried on for some years, yet in the end it will be found to have produced its effect.

SLEEP of Infants, 285; after weaning, 295.

SLOUGH, Nature of, 76; treatment of, 406.

SMALL-POX, Symptoms of, 31; inoculation for, 33; treatment of, in children, 300; in adults, 360.

SMELL, Sense and organ of.—See *Nose.*

SNEEZING.—A convulsive effort to clear the nose of some offending substance. As a *symptom*, it precedes common cold, influenza, and measles,

SNUFF.—See *Tobacco.*

SNUFFLES.—When children have a severe cold, they are often said to have "the snuffles," from the fact that not having the sense to clear their nostrils, they continually breathe through a collection of mucus in them.

SOAP.—A compound of oily matter with potass (*soft soap*), or soda (*hard soap*). It is sometimes used to make up pills with; united with litharge, it forms a harder substance called soap-plaster, 241.

SOAP, Compound pill of, 241; liniment, *ib.*; plaster, *ib.*

SODA.—A compound of oxygen with the metal *sodium*, in which state it unites with various acids to form a *carbonate*, *sulphate*, &c.

SODA, Solution of chlorinated, 229; bicarbonate of, 243; sulphate of, *ib.*

SODA WATER.—Water loaded with carbonic acid gas, in which a small quantity of soda is dissolved. See *Carbonated Waters*, 250.

SOLUTION (*liquor*).—A fluid in which some substance is dissolved.

SOMNAMBULISM.—See *Sleep.*

SORE-NIPPLES, Treatment of, 504, 505.

SORE-THROAT.—A state of active or passive congestion, or of inflammation, with or without ulceration of the mucous membrane of the throat. See *Quinsy*, &c., 453.

SORE-THROAT, Treatment of ulcerated, 453.

SORE-THROAT, Malignant. — See *Scarlet Fever.*

SOUND.—See *Hearing.*

SOUND.—A surgical instrument for exploring cavities, such as those of the *bladder*, *uterus*, &c.

SOUP.—A strong animal decoction; receipt for making it suitable for invalids, 247.

SPASM, Nature of, 91; treatment of, 417 *et seq.*—as cramp, 417; colic, *ib.*; hiccup, 418; of ordinary spasms, of hysteria, and of the stomach, *ib.*

SPATULA.—A knife with a blunt edge, for spreading ointments and rolling pills, &c.

SPECIFIC MEDICINE.—One which has a remarkable and particular effect over certain diseases, as cinchona and arsenic over *ague.*

SPECTACLES, or *Glasses*, are employed to relieve the inconvenience caused by short-sight, long-sight, and the absence of the lens after cataract, as well as to moderate the effects of the powerful light of the sun, or artificial light, for which last purpose they are stained, or as it is called "coloured." Thus, spectacles are divided into concave, convex, and coloured. There are also plano-convex and concavo-convex glasses; but the above three varieties are those which are generally employed.

(*a*) *Concave glasses* are made of various degrees of concavity, calculated for every form of convexity of the cornea (see *Short-sight*, 163). The English numbers range from two degrees below one (the slightest or lowest degree) to twenty; but the French are differently numbered (see *par. f*). The highest concavity, which is often wanted, is six or seven. Glasses for short-sight, if intended to be worn in the eye, are much more comfortable when made of the concavo-convex form, by which there is far more room for the eye-lashes to play, and at the same time the effect on the sight is equally good.

(*b*) *Convex glasses*, when intended for in-door work, are seldom required to be of high power, and those called "clearers" are very slightly convex. When these have been used for a short time, a higher power is generally necessary. For those who have lost the lens by operation, a very convex glass must be employed (see *par. f*).

(*c*) *Coloured glasses* are either green or grey. The former are used for very irritable or weakened conditions of the nerve of the eye, or for such cases of inflammation as are aggravated by light. Grey glasses are sufficient for trifling cases, and do not so much interfere with the ordinary occupations, as any kind of work may be seen through them.

(*d*) *All kinds of glasses* should be made of very hard glass, and those now sold as "pebbles" are of that description. Cheap spectacles are very soft, and therefore more easily ground; but as they readily scratch every time they are wiped, they are soon covered with these defects, and are in consequence never clear, from which cause they try the eyes sadly. The accuracy or truth of the grinding is also a point of great importance, and many of the cheap glasses are merely cast and afterwards polished, without any certainty as to the section of their surfaces being segments of circles which they ought to be. Every one, therefore, who can afford it should employ a respectable optician, and in the long-run it will be found most economical to use glasses which are properly made of hard glass, even if they cost double or treble what an inferior article can be bought for.

(*e*) *In choosing glasses* there is a great deal of quackery and nonsense. There is but one rule as to the concavity or convexity, and that is to use only such as are pleasant to the eye, and in all cases to err rather on the side of weakness than power. It is well known that the eye cannot long be kept at one pitch, if the condition is that, so common in old age, of increasing flatness of the cornea. Here the progress has been made from a healthy condition to a defective one, and the same cause goes on to increase the defect, whether glasses are worn or not. It is quite true that the accommodating power, alluded to at page 333, will make some little difference if drawn upon; but over and above this slight drawback, the use of glasses certainly does not hasten the alteration of the eye. All those, therefore, who are in want of such assistance may safely indulge themselves with such a glass as is comfortable to them; and if it affords them clear vision without fatiguing the eye, they may rest satisfied that they are deriving all the benefit of which the optician's art is capable. A short-sighted person should choose glasses which will enable him to see the lines of objects pretty distinctly at about forty-five feet, without being diminished at all. Sometimes the two eyes are of different focal power, and if so, the glasses should be adjusted so as to give to each eye the same clearness of vision at the above distance. Still more rarely, one eye is short-sighted and the other long, when one concave glass only should be worn out of doors for the former, and another convex, if necessary, in doors for the latter. If the glass after a time becomes insufficient, as it generally does, they should increase the power, and this will do them far less harm than the straining of the eye at a confused mass of letters, rendered barely visible by their previously insufficient glass. Short-sighted people are troubled in a different way, and one at the same time that requires still more attention. As they become older, their eyes become flatter from the same cause which affects the long-sighted person, and the consequence is that their glasses become insufficient *from being too strong*, so that they require them less concave than before. This is particularly the case with those who only wear their glasses occasionally; for if worn constantly, the eye becomes accommodated to their use, and the necessity for change is not so obvious; but so far from being objected to, it should be hailed with pleasure as the harbinger of a more perfect state of vision, to which each succeeding change in the power of the glass will bring the wearer more and more near.

(*f*) The following are the numbers used by the British and French opticians, which it will be seen do not exactly coincide, the latter having a much more extensive range :—

CONVEX GLASSES (*Long-sight*).

French.—80, 72, 60, 48, 36, 30, 24, 20, 18, 16, 15, 14, 13, 12, 11, 10, 9, 8, 7, 6, 5, 4½, 4, 3½, 3, 2½, 2, 1¾, 1½, 1.

British.—48, 36, 30, 24, 20, 18, 14, 12, 10, 9, 8, 7, 6, 5½, 5, 4½, 4, 3⅝, 2¾, 2⅝, 2½, 2⅙, 2, 1¾, 1½.

The numbers below 5 in both these scales are confined to those who have lost the lens by operation.

CONCAVE GLASSES (*Short-sight*).

French.—60, 30, 20, 18, 16, 15, 14 12, 12, 11, 10, 9, 8, 7, 6, 5, 4½, 4, 3¾, 3½, 3, 2¾, 2½, 2, 1¾, 1½, 1⅕, 1.

British.—00, 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20.

SPECULUM.—In surgery, a polished tube through which the internal organs may be examined.

SPEECH.—See *Voice.*

SPERMACETI, Properties of, 243.

SPHINCTER MUSCLES.—Circular fibres which close the openings of certain passages, as the *sphincter of the anus and bladder.*

SPIGELIA (*Indian pink*), 243.—See also *Worms.*

SPINACH.—See *Vegetables.*

SPINE.—See *Skeleton.*

SPINE, Symptoms of disease of the, 139; treatment of, 327.

SPINAL CANAL, Treatment of effusion of blood into the, 465.

SPINAL CORD, Structure of, 113; congestion and inflammation of the, 127, 128; treatment of, 464.

SPINAL IRRITATION, Symptoms of, 128; treatment of, 464.

SPINE, Treatment of curvature of, 428; of fracture of, 439.

SPIRITS.—A term synonymous with "nervous power." Thus, "low spirits" and "high spirits" are indicative of a low or high condition of nervous power or energy, and are generally, but not always, associated with a corresponding state of the body.

SPIRITUOUS LIQUORS, *Spirits*, or *Ardent Spirits*, which are merely different names for the same thing, are the result of the distillation of some kind of fermented liquor. Thus *Cognac* or *French brandy* is distilled from the juice of the grape; *rum* from the fermented juice of the sugar-cane; *gin, whiskey*, and *British brandy* from infusions of malt, oats, or barley, sometimes mixed with potatoes or carrots. *Arrack*, distilled from rice, is not used in this country at all, nor are any other ardent spirits, except pure alcohol more or less mixed with distilled water, and sold under the name of *spirits of wine.* The term *spirit* is also commonly used for certain alcoholic mixtures, in which this stimulating principle predominates, differing in that respect from tinctures, in which the alcohol is only made the vehicle for a more powerful agent. Thus, we have *proof spirit*, *ardent spirits*, *spirit of nitric ether*, *of ammonia*, &c.; but to this there are exceptions, as in the case of *spirit of camphor* and *spirit of horseradish*, so that it may be seen that the terms are used somewhat loosely. See *Fermented Liquors.*

SPIRIT OF WINE.—A name popularly given to alcohol of the strength generally known as *proof spirit.* See *Alcohol.*

SPIRIT, Proof.—See *Alcohol.*

SPIRIT OF AMMONIA, Compound (*sal-volatile)*, 243; fetid, of ammonia, 244; of horse-radish (compound), *ib.*; of nitric ether, *ib.*; of sulphuric ether, *ib.*

SPITTING OF BLOOD.—A term generally applied to hemorrhage from the lungs, 146; but blood may also be spit from the mouth when it comes from the stomach, 146; or the gums may bleed from sponginess or scurvy, 166; or sometimes the bleeding which shows itself at the mouth is from the nose, 146; or from the mucous membrane of the back of the throat, when congested or ulcerated.

SPLEEN, Structure of, 91; symptoms of inflammation of, 102; treatment of, 445.

SPLINTS, Nature of, 266; application of, see *Fractures*, 431.

SPONGE.—This natural production is too well known to need description; but it may be remarked that in all cases where sponges are employed in accidents or diseases, they should be perfectly clean, and if the surface to which they are applied is deprived of its cuticle, sponge which has ever been used for the purposes of ablution should not be allowed to touch it.

SPONGE, Burnt.—An old remedy for bronchocele containing iodine, and now supplanted by that drug in its separate form.

SPONGING BATH, 254.

SPONGIO-PILINE, Nature and use of, 264. See also *Embrocations*, 349.

SPORADIC.—A term applied to solitary cases of disease, in distinction from epidemic or endemic attacks. It is seldom employed, except for those diseases which sometimes belong to either class.

SPOTS, or *Marks*, varieties of, 72; treatment of, 390.

SPRAINS, Nature and treatment of, 418, 419.

SQUILL, Properties of, 244; compound pill of, 241.

SQUINTING (*Strabismus*) Nature of, 163; treatment of, in children, 332; in adults, 490.

STARCH, Decoction of, 233.

STEEL.—See *Iron.*

STERNUM (the *breast-bone*). — See *Skeleton.*

STERTOR.—A snoring kind of breathing which occurs in apoplexy, 118; and coma, from other causes. See *Coma.*

STETHOSCOPE.—A cylinder of wood or other sonorous material which is interposed between the ear and the body of the patient, partly for the sake of convenience, and partly in order to fix upon the exact sources of the sounds. See *Auscultation.*

STEWED MEATS for Infants, 285.

STIMULANTS, Nature and varieties of, 190; formulas for, 344.

STINGS of Insects, &c., treatment of, 400.

STITCH. — A muscular pain in the side. See *Pleurodynia*, 81; treatment of, 410.

STOMACH, Structure of. — See *Alimentary Canal.*

STOMACH, Symptoms of inflammation of the mucous membrane of the, 52; of indigestion of the, 155 *et seq.*

STOMACH, Treatment of inflammation of the mucous membrane of the, in children, 305; in the adult, 376; of indigestion of the, 483 *et seq.*

STOMACH-PUMP, Method of using, 507.

STONE (*calculus*).—This term is applied to concretions in the gall

bladder or ducts, which are formed from the bile itself, and termed gall-stones, 101; or to those of harder material, which form in the kidneys and bladder, 103 *et seq.*

STONE, Gall, treatment of, 444.

STONE in the Kidneys or bladder, treatment of, 449.

STOOLS.—See *Fæces.*

STOVES.—See *Grates.*

STRAINING, Violent, may occur either in vomiting, of which it is only a severe degree, or in diarrhœa or dysentery, when it receives the name of *tenesmus.* See *Diarrhœa* and *Dysentery.*

STRAMONIUM. — A herb which is sometimes smoked for the relief of asthma. The dried leaves are reduced to a coarse powder and smoked in an ordinary pipe two or three times a day.

STRANGURY, Nature and treatment of, 450.

STRAWBERRY.—See *Fruits.*

STRICTURE OF THE ŒSOPHAGUS is beyond the reach of domestic treatment, but fortunately is a very rare disease.

STRICTURE OF THE RECTUM is a mechanical closing of that bowel, either from chronic inflammation or from malignant disease. It may be discovered from the appearance of the motions passed, which appear as if squeezed out through a small opening, and are sometimes no larger than a quill in diameter. The disease is, however, beyond the reach of domestic treatment, and should at once be placed under the care of a skilful surgeon.

STRICTURE OF THE URETHRA, 451.

STRUMA.—A term synonymous with *Scrofula*, 133.

STRUMOUS OPHTHALMIA, Symptoms of, 162; treatment of, 489, 490.

STRYCHNINE, Use of, 463; symptoms of poisoning by, 175; treatment of, 511.

STUNNING (*concussion of the brain*), Symptoms of, 118; treatment of, 459.

STUPOR.—A state approaching to *coma*, which see.

STYE, Nature and symptoms of, 162; treatment of, in children, 332; in the adult, 488.

STYPTICS.—Substances employed to check hemorrhage, generally of an astringent nature. See formulas for *Astringents*, 345; and treatment of *Hemorrhage*, 477 *et seq.*

SUBSULTUS TENDINUM. — See *Limbs, Twitching of the.*

SUFFOCATION, Treatment of, 512; when caused by carbonic acid gas, 513.

SUGAR is the produce of the sugar-cane, some of it being imported from the West Indies, other qualities from Brazil, Porto Rico, and Manilla, and others again from the East Indies, the Mauritius, and Java. There are two kinds, which are chemically different, and are known as *cane-sugar* and *grape-sugar*—the former being obtained from the sugar-cane, the maple-tree, the root of the beet, the mallow, and some other forest trees and cultivated plants; while the latter is contained in varying quantities in those fruits which are more or less sweet, especially in the grape, fig, plum, &c. Honey contains a portion of each, as in fact do most sweet substances, and even the cane-sugar itself, especially the moist sorts, in the shape of treacle, which is composed almost entirely of grape-sugar.

(*a*) *Cane-sugar* consists, like all sugars and similar compounds, of carbon, hydrogen, and oxygen, and is therefore free from nitrogen altogether. The proportions of these in crystallized cane-sugar are stated in the usual way by the following formula:—Carbon 24, hydrogen 22, oxygen 22. It is to be found in the several canes, trees, and roots mentioned above, from which it is extracted by various processes, according to the nature of the substance containing it. It is perhaps most readily obtained from the maple-tree, which, in America, is found extensively in the natural forests, and only requires tapping with an auger, and the insertion of a small pipe, to cause the saccharine and limpid sap to flow out, and by the application of heat alone in an

iron vessel suspended over a fire, an excellent crystallized sugar is produced. When sugar-canes are the sources of sugar, a mill is used to crush them between its rollers, and the expressed juice being collected is slowly evaporated, until, by the aid of the hydrate of lime, the sugar is separated in a crystalline form. The lime acts by coagulating the albumen, and separating it, together with the earthy phosphates and waxy matter. The resulting mass is partly composed of *raw* or *Muscovado sugar*, and partly of *molasses* or *treacle*, the latter being drained off, and leaving the former behind. This raw sugar is further refined by redissolving it in water, and adding albumen, in the shape of blood or white of egg, with a little lime-water, and heating the whole till it boils; the albumen acting in the same way as in other cases of clarifying, by entangling the foreign bodies in its meshes as it is being converted from the fluid to the semi-solid condition. The solution, though now clear, is still coloured, and requires to be passed through animal charcoal, in order to get rid of this adjunct. After which, the solution or syrup is evaporated again, and poured into conical earthen moulds, where it solidifies in process of time, and becomes that irregular crystallized mass known as *loaf* or *lump sugar*. This requires to be still further cleaned, by passing through it a stream of clear syrup, after which it only remains to dry it in a stove, and the loaf is fit for use. Sometimes a fine and soft *clay* is placed over these moulds, serving still further to assist the clarifying process by straining the syrup. When crystallization is suffered to take place slowly, and without disturbance, a more perfect crystal is produced, known as *sugar candy*. In most cases, evaporation is conducted in close boilers exhausted of air, called *in vacuo*, by which the boiling point is reduced from 230° to 150° Fahrenheit, and the risk of burning is materially diminished. On the continent of Europe, beet-root is cultivated largely with a view to produce sugar; but the process is tedious and expensive, and the sugar cannot compete in price with that from the sugar-cane. Pure cane-sugar separates from the syrup in crystals, having the figure of a modified oblique rhombic prism, of a large size, transparent, and nearly, or quite, colourless, according to the condition of the syrup. It has a pure sweet taste—is soluble in one-third of its weight of cold water, and in a larger quantity of alcohol. When moderately heated, it melts, and solidifies in cooling into a transparent mass without form, known as *barley-sugar*. On the application of a higher degree of heat, it is decomposed, and more or less blackened or browned, and this effect is also produced by the long-continued boiling of the solution at a high temperature, which also tends to prevent its crystallizing. In this last condition, it is well known as *caramel*, and is used for colouring spirits, wines, &c., containing a smaller proportion of hydrogen and oxygen. Carbon 24, hydrogen 18, oxygen 18.

(*b*) *Grape-sugar*, known in chemistry also as *glucose*, consists of a larger proportion of hydrogen and oxygen than cane-sugar or caramel described in the last paragraph. For grape-sugar itself, the formula is thus represented:—Carbon 24, hydrogen 28, oxygen 28. It may be extracted from the juice of sweet grapes, or from honey, of which it forms the solid crystalline portion, by washing with pure alcohol, which dissolves the fluid syrup; or it may be artificially prepared by chemical agency from starch, woody fibre, &c. Grape-sugar is readily distinguished from cane-sugar, by being less sweet and more insoluble in water; also by the difference in the shape of its crystals, which are never of definite angular forms, but in granular warty masses, which seldom present any crystalline form at all. It resembles cane-sugar in being nearly white when pure, in melting, and in suffering the same discoloration by heat. Cane-sugar combines readily with lime, baryta, and oxide of lead, while grape-sugar is with difficulty made to unite with them. Besides these distinguishing marks, the two may be known from each other by taking a portion of the solution to be tested, and mixing with it a solution of the sulphate of copper, and a solution of caustic potash, both being in excess. A deep blue liquid is the result in any case, which, when heated, indicates the kind of sugar present by the following appearances:—If containing cane-sugar, at first but little change is produced; but after a short time small quantities of red powder fall to the bottom, in spite of which, the liquid retains its blue colour. The presence, however, of grape-sugar is at once indicated by a copious greenish precipitate, which rapidly changes to scarlet, and afterwards to a deep reddish brown, leaving a nearly colourless solution. By this test, after a little experience, the proportional quantities of each may be discovered in any solution according to the shades of colour in the deposit.

(c) *Liquorice sugar* is another variety of sugar which is found in the root of the liquorice plant, and is soluble in water, but refuses to crystallize. A remarkable fact is, that it cannot be made to ferment.

(d) *Milk sugar* is another curious sugar, found in milk, and composed of exactly equal proportionals of carbon, hydrogen, and oxygen. It is obtained in large quantities from whey, by evaporating it to a syrup, and purifying the sugar, which crystallizes out, by animal charcoal. It presents the form of a four-sided prism, and is very hard, white, and transparent. The taste is very slightly sweet, and it feels gritty to the teeth when undissolved. It also is not readily fermented.

(e) *The sugar of manna* is contained in the substance known as manna, which is an exudation from a species of ash. This sugar is fusible without loss of weight, is readily dissolved in water, has a strong and powerfully sweet taste, and has no purgative qualities, which reside in the other elements of the manna; like that of liquorice, it refuses to ferment.

SUGAR OF LEAD.—The ordinary name for *Acetate of Lead*, which see.

SUGAR OF LEAD, Symptoms of poisoning by, 173; treatment of, 509.

SULPHATE.—The union of sulphuric acid with a base—as sulphate of soda, 243; of zinc, 246; of magnesia, 237; of iron, 244; of copper, 231.

SULPHATE OF COPPER, Symptoms of poisoning by, 174; treatment of, 509.

SULPHUR.—An elementary body which is found in nature in a tolerably pure state. It is given internally as a mild aperient and alterative, especially in piles, for which it is almost a specific, and in skin diseases. If long taken in repeated doses, it produces an eruption, from the stimulating effects of its exhalation by the skin, in the shape of sulphuretted hydrogen, which occurs to such an extent as to be unpleasant to the nose, and to blacken any silver articles carried in the pockets. It is also used externally as an ointment, 249, and combines with potassium (*sulphuret of potassium*) both internally and externally. This salt forms the basis of some suphur waters. See *Mineral Waters*.

SULPHURIC ACID, Medical properties of, 224; symptoms of poisoning by, 171; treatment of, 507.

SULPHURIC ETHER, Spirit of, 244.

SUN-STROKE (*coup de soleil*).—After exposure to the rays of the sun on the head, a sudden fit of insensibility is sometimes produced, in which the patient falls to the ground. The proper treatment consists in the application of wet cloths to the head, and the administration of brandy and water, or ammonia internally. If the pulse is full and labouring, it may be necessary to take blood, either from the arm or from the temporal artery. See *Bleeding*, 256, 258.

SUPPER is a meal which is generally

taken by those who dine early, and who are so much occupied during the day as to be unable to enjoy in peace any other meal. As a rule, it should not be taken within an hour of going to bed; but to those whose stomachs are sound, and not overdone by food, the act of sleeping after a meal is not so prejudicial as it is often supposed. On the other hand, in cases of weak digestion, suppers are followed by flatulence and distressing dreams, and should be, therefore, avoided. Many people are unable to sleep without some light kind of supper, and in such cases an indulgence in any kind of food which has been found to agree is to be recommended.

SUPPOSITORY.—A solid medicated substance introduced into the rectum, in the shape of an oblong mass, about the size of a horse-bean. It is used for quieting or soothing the parts in irritable conditions of the *rectum*, *bladder*, or *womb*.

SUPPURATION.—The formation of matter as one of the consequences of inflammation, 42, 43.

SURGERY, Various appliances used in domestic, 256 *et seq.*

SUSPENDED ANIMATION (*asphyxia*), treatment of, 512, 513.

SUTURE in Anatomy, see *Joints;* in Surgery, see *Wounds*, 396 (*c*).

SWALLOWING.—See *Pharynx.*

SWEAT.—See *Perspiration.*

SWEET SPIRITS OF NITRE (*spirit of nitric ether*), 244.

SWELLING is one of the signs of inflammation, 41; but it may occur without that condition from congestion, 41, followed by effusion of serum (œdema) or blood (hemorrhage) either into the cellular membrane or into any other part; or swelling may occur from the growth of a tumour; or it may arise from a rupture, 426; or prolapse, 428; or, lastly, it may be the result of an escape of air from the lungs. See *Emphysema.*

SWINE-POX.—See *Chicken-pox*, 37.

SWOON.—A popular name for *fainting* or *syncope.* See *Fainting*, 116.

SYCOSIS (*chin-welk*), Symptoms of, 67; treatment of, 388.

SYMPATHETIC NERVES. — See *Nervous System*, 112.

SYMPATHETIC FEVER, Nature of, 44; treatment of, 369.

SYMPATHETIC HEADACHE, Symptoms of, 126; treatment of, 464

SYMPATHY.—When, in consequence of some nervous connection only, one part takes on a corresponding action with that which previously existed in another, it is said to sympathise with it; and thus we often have pain in the knee from disease of the hip-joint, and both eyes inflamed when one only is injured.

SYMPTOMS OF DISEASE, Proper interpretation of, 21, 22; enumeration of, 23—177.

SYNCOPE.—See *Fainting.*

SYNOVIA. — The fluid contained within the synovial capsules, 77.

SYNOVIAL MEMBRANES, or *Capsules*, Structure of, 77.

SYNOVIAL CAPSULES, Symptoms of inflammation and congestion of the, 84; treatment of, 412.

SYRINGES, Different kinds of, 266, 507.

SYRUPS, Various, 244; of iodide of iron, *ib.*

SYSTOLE.—The contraction of the heart. See *Heart, Anatomy of the.*

TABES MESENTERICA.—See *Atrophy.*

TAMARINDS, as used in medicine, are the pods of the *tamarind tree* preserved in sugar. The pulp is sweet, with an acid and somewhat astringent taste, and is mildly laxative, but is only used to make a cooling drink by dissolving in water, or to act on the bowels of habitually costive children.

TANNIN, or *Tannic Acid.* — The astringent principle of the nut-gall, and some other vegetable substances. It is very similar in its effects to gallic acid, 223, which is prepared from it by the decomposition of nutgalls. It is so readily decomposed by the contact with air, that gallic acid is more generally used.

TAPE-WORM, Nature and symptoms of, 158; treatment of, in children, 331.

TAPIOCA is the pith of the *manihot* tree, washed, as in the case of sago, and converted by art into masses of a larger size and more irregular shape. It is imported from Brazil and the East Indies, and is exceedingly nutritious and agreeable to the palate when flavoured by the addition of milk, spices, fruits, &c. It is very wholesome at all periods of life, and though quite as nourishing, yet it does not cause flatulence or constipation like rice. It is adulterated to some extent with sago, potato starch, &c., which can scarcely be detected, except by the microscope.

TAPIOCA PUDDING, Receipt for, 293.

TAPPING.—In surgery, the drawing off, from serous cavities, of their contents by an instrument called a *trocar*.

TAR is prepared from various trees of the *fir* tribe, chiefly on the borders of the Gulf of Bothnia. It is a thick, tenacious, opaque fluid, with a strong peculiar odour, and a bitter taste. It is only used in medicine in the shape of *tar water*, which is prepared by stirring two pounds of tar in a gallon of water for a quarter of an hour; then, as soon as the tar has subsided, strain off the liquor, and bottle. Externally, it is applied as *tar ointment*, the place of which is now usurped by the *ointment of creasote*, 230. *Tar water*, as above prepared, is used in scaly diseases of the skin. See *Psoriasis* and *Lepra*, 390.

TARAXACUM.—See *Dandelion*.

TARTAR OF THE TEETH, 166; removal of, 492.

TARTAR EMETIC (*potassio-tartrate of antimony*), properties of, 225; wine of, 246; symptoms of poisoning by, 174; treatment of, 509.

TARTARIC ACID, Properties of, 224.

TASTE, Organ of.—The sense of taste appears to reside partly in the nerves distributed to the mucous membrane of the tongue, and partly in those on the palate (see *Palate* and *Tongue*). It is liable to be altered or lost by disease, as we continually find. Thus in a severe cold, the sense of taste is for the time completely lost. It is also depraved in a most remarkable manner, in *mania*, 151; and to some extent in *chlorosis*, 132; and in *pregnancy*.

TAXIS.—The mechanical method of reducing *ruptures*, 427.

TEA.—This well-known article of grocery is the leaf of the tea-tree dried and stored for use. These leaves are gathered at three or four different seasons, by which, in some measure, the different qualities of tea are produced, those first picked being most valuable, and the last coarse and large. The young leaves are narrow, convoluted, and downy; the middle-aged have their edges serrated and veined with more or less delicacy; whilst in the older leaves, the serration and venation are more marked; and, in addition, some peculiar hoops are developed along the margins, which are readily seen when they are examined. All teas are divisible into black and green, depending partly upon the age of the leaves, partly upon the locality where grown, and partly upon the method of drying. Thus, the black tea is not only roasted in a shallow iron vessel, called a *kuo*, but it is also again submitted to the action of a charcoal-fire in sieves. Green tea, on the other hand, escapes the second process. Teas are also *rolled* by the hand, when half-dry. Black teas are known as *bohea*, *congou*, *souchong*, and *pekoe*; green teas, as *twankay*, *hyson*, *imperial*, and *gunpowder*. These qualities of black and green tea are chiefly dependent upon the age of the leaves when gathered. More varieties are known in the trade, but the above are the leading sections into which this article is divided. Common teas are artificially scented—as, for instance, by the cowslip, which is added to the tea in layers, both being previously dried, and alternately placed in the canister or chest. After some days the cowslips are removed by sifting, and the tea thus scented is mixed with other teas, if too highly scented, or with more cowslips, if not sufficiently so. This is the process for making cowslip hyson; but black teas are also similarly flavoured, and with them the flower of the cowslip is reduced to a powder and actually mixed with the tea in the last roasting process, and left there. Besides the cowslip, other flowers are used to scent souchong teas, as the *gardenia florida*, *olea fragrans*, and *jasminum sambac*.

TEA, as drunk at our morning and evening meals, is an infusion of the above articles, containing *gum*, *saccharine matter*, *tannin* in large quantities, and *theine*, which last is identical with *caffeine*, both being important elements, and containing nitrogen. Green tea almost invariably contains some added matter, in the shape of glazing or colouring, consisting in most cases of *Prussian blue* or *indigo*, *turmeric powder*, and *china clay*. Many other matters are occasionally used for the purposes of adulteration, which will be found described under that head. The amounts of gum and tannin contained in any infusion are good tests of its value; but the really useful principle is the theine, which is the cause of the peculiar effects of this important article of diet. See remarks at 16; also article *Theine*.

TEARS.—The watery secretion from the lachrymal gland.—See *Eye, Anatomy of the*.

TEETH, Formation of, 92, 93; diseases of, and their treatment, 165, 297; extraction of, 261.

TEETHING, Progress of, 297; management of the child during, 297, 298.

TEMPERAMENT, Influence of, on health and disease, 2.

TENACULUM.—A fine hook, or small pair of spring-forceps, for laying hold of wounded arteries. See *Hemorrhage*, 396.

TENDERNESS (*pain on pressure*).—It is a sign of inflammation, but *may* be present without that condition, though as an exception to the rule. It is always, however, important to ascertain whether tenderness of an important part like the abdomen is due to inflammation of the muscles or of the deep-seated parts; and in this there is often some difficulty, requiring experience to conduct the investigation, and sometimes only to be managed by considering the attendant symptoms, which are trivial if it is of a muscular nature, and severe in proportion to the extent of the internal mischief.

TENDONS, Structure of the, 85; nature of inflammation of the, 86; treatment of strains of, 418.

TENDO ACHILLIS.—The large tendon which acts upon the heel with the whole force of the muscles of the calf, of which it is a continuation. Sometimes in using violent exercise, the muscle is torn across (*ruptured*), and the consequence is great pain and lameness, which will require long rest for their removal. The treatment is very simple, consisting in the early stage of the usual remedies for strains, 418, and afterwards of the constant use of a slipper with a strap from the heel to the thigh above the knee, which it encircles with a soft pad. By drawing this pretty tight, the two ends of the tendon are brought near together, and in the course of months may be expected to unite; during which time, walking, if practised at all, must be either with a crutch or with the knee on a wooden leg, in the usual mode adopted when the leg has been removed below the knee. On recovering the use of the tendon, a high heel, with a laced boot, should be used for some time as a precaution against a return of the accident.

TENESMUS.—See *Straining*.

TENT.—A piece of lint or sponge rolled up into a pointed form, and introduced into a wound in order to keep it open.

TERTIAN.—See *Ague*, 27.

TESTICLE, Treatment of acute inflammation of, 454.

TETANUS, Symptoms of, 129; treatment of, 466.

TETTER, Corroding, see *Lupus*; crusted, see *Impetigo*.

THEINE, *Caffeine*, *Theobromine*, and *Piperine*, are four vegeto-alkalis, identical in composition, and in their effects upon the human body. They are met with in the four most common articles in domestic use—namely, tea, coffee, cocoa or chocolate, and pepper, and in very few other vegetable substances. In making selection of tea, coffee, cocoa, and pepper, man has instinctively, or rather by experience, chosen those substances which will impart the greatest quantity of nitrogen, conjoined with tannin and other conservative principles. They are soluble in about one hundred parts of cold water, and much more readily in boiling water or if an acid be present. In order to precipitate theine or caffeine, a decoction of common tea or of raw coffee-berries, previously crushed, is mixed with excess of solution of basic acetate of lead. The solution filtered from the copious yellow or greenish precipitate, is treated with sulphuretted hydrogen to remove the lead, filtered, evaporated to a small bulk, and neutralized by ammonia. The caffeine or theine crystallizes out in cooling, and is easily purified by animal charcoal. It forms tufts of delicate white silky needles, which have a bitter taste, melt when heated, with loss of water, and sublime without decomposition.

THEOBROMINE.—See *Theine.*

THERAPEUTICS, General principles of, 219 *et seq* ; infantile, 268.

THERMOMETER. — An instrument which is employed to ascertain the temperature of bodies by taking advantage of the expansion of certain substances when heated. Spirit or mercury are those most commonly employed; but for high temperatures, earthy matters must be substituted, inasmuch as both spirit and alcohol are volatile. Four scales of registration are employed, one of which (Fahrenheit's) is that which is almost universal in this country; but in France, the centigrade, and in Germany, Reaumur's scale are the prevailing ones, while the Russians adhere to that of De Lisle. The boiling and freezing points of water will readily serve to show the comparative measurements of each of the above scales, as indicated in the following table :—

	Fahrenheit.	Centigrade.	Reaumur.	De Lisle.
Boiling point	212°	100°	80°	0°
Freezing point	32°	0°	0°	150°

So that, between these two well-marked points, Fahrenheit divides his scale into 180 degrees, the centigrade has 100, Reaumur 80, and De Lisle 150 degrees. The 0° is called *zero*, all degrees below which are called *minus*, and marked — and in the Reaumur and centigrade scales, the degrees above *zero* are marked thus + 20°. In order to convert one scale into any other of these except De Lisle's, which is seldom met with, the following rules are applicable :—

Comparison of Thermometric Scales.

1. To convert the degrees of centigrade into those of Fahrenheit, multiply by 9, divide by 5, and add 32.
2. To convert degrees of centigrade into those of Reaumur, multiply by 4, and divide by 5.
3. To convert degrees of Fahrenheit into those of centigrade, deduct 32, multiply by 5, and divide by 9.
4. To convert degrees of Fahrenheit

into those of Reaumur, deduct 32, divide by 9, and multiply by 4.

5. To convert degrees of Reaumur into those of centigrade, multiply by 5, and divide by 4.
6. To convert degrees of Reaumur into those of Fahrenheit, multiply by 9, divide by 4, and add 32.

THIGH.—The part of the lower extremity between the knee and the hip.

THIGH-BONE (see *Skeleton*), Treatment of fracture of, 438.

THIRST, Nature of, 155.

THORAX.—See *Chest.*

THORN APPLE.—See *Stramonium.*

THREAD-WORM, Nature of, 157; symptoms of, 158; removal of, 331.

THROAT.—A popular term applied somewhat loosely to signify—1st, the back of the mouth, called in anatomy the *fauces;* and 2nd, the *exterior* of the front of the neck. See *Fauces* and *Pharynx.*

THROAT, Ulcerated, treatment of, 453. See also *Sore Throat*, *Tonsils*, and *Uvula.*

THUMB, Treatment of dislocations of, 421.

THRUSH (*aphtha*), Nature and treatment of, 336.

THYMUS GLAND.—A gland which is found behind the breast-bone at birth and for some time afterwards. It answers to the sweet-bread of the calf, but its use is not well ascertained.

THYROID BODY, or *Gland*, is a peculiar spongy mass lying on each side of the trachea, with a small connecting band. It is abundantly supplied with blood; but it is not similar to other glands in structure, nor has it like them a duct to carry off its secretion. It is liable to enlargement, called bronchocele or goitre. See *Bronchocele.*

TIC DOLOREUX.—A form of *Neuralgia*, 466.

TINCTURES, Nature of, 245 (see also *Spirits*); varieties of, 245—as compound of benzoin, *ib.;* of columba, gentian, cascarilla, cinchona, and cardamons, *ib.;* compound of camphor, *ib.;* of cantharides, *ib.;* of ginger, *ib.;* of henbane, *ib.;* iodine, *ib.;* compound of lavender, *ib.;* of myrrh, *ib.;* of opium (laudanum) *ib.;* of quinine, *ib.;* of rhubarb (compound), *ib.;* of valerian (compound), *ib.*

TOAST-WATER is best made by toasting a piece of bread to a dark brown (not burnt), and then putting it into a jug; the latter should be filled with boiling water. As soon as it is cold it is fit for use.

TOBACCO.—The dried leaves of *nicotiana tabacum.* These are sometimes used in medicine, but for purposes for which they can never be required in domestic practice. *Snuff* is occasionally useful as a counter-irritant in congestive headache; but it is in its relations to the universal practice of smoking that tobacco has become so interesting. A violent controversy has recently been carried on with regard to the use and abuse of this article, which like most controversies has been carried to extremes on both sides. Personally I confess that I have a strong dislike to the practice; but I cannot deny that arguments may be adduced in support of the moderate employment of tobacco smoke. Thus, there is no getting over the fact that all nations, ancient and modern, savage as well as civilized, have habitually employed some narcotic, and if this is granted (which, I think, it must be), it becomes a question whether tobacco, from this universal assent to the necessity of *a* narcotic, is entitled to be considered *the* one which unites the greatest number of advantages with the least objectionable qualities. It certainly is better to use tobacco smoke than opium, either in a solid form or by smoking it; and probably it is also less prejudicial than Indian tobacco or hemp. Like every other habit, it may be indulged in to excess; but that is not the question, which is simply whether a moderate use of tobacco is prejudicial or otherwise. It may be remarked that habitual smokers do not inhale the tobacco smoke, but simply draw it into their mouths, so that you may sometimes see the smoke forced out of the mouth at the very moment when inspiration takes place through the nostrils. The subject is a very difficult one to form an opinion upon; but it may undoubtedly be concluded that tobacco is not necessary to the health of individuals, and also that its use is too often carried to an excess which leads to nervous disorders of a grave character. It is, therefore, the safest plan to avoid acquiring the habit; but if it is once learnt, and the person indulging in it can only keep within moderate bounds, I can see no absolute reason why he should be recommended to discontinue it—that is to say, if he can afford the expense which attends upon it, and which is by no means small. I am now alluding only to the smoking of two or three pipes or cigars daily, and not to the perpetual furnace which some people make of their mouths, and which can only be considered an abuse. Employed in this moderate way, tobacco appears to be a great tranquillizer of the nervous system; and in the present unnatural and highly stimulated condition of society, it may perhaps on the whole be advantageous rather than otherwise. The brain is often so over-worked for a number of hours together, that it requires some ready means of quieting it down without loss of time, and probably tobacco may possess that power to a greater extent than tea or coffee, and with less injury to the system than those articles will produce, if swallowed in sufficient strength. *Tobacco-chewing* is a form of taking tobacco which is not used in this country except among the labouring classes, and is not common among them. It requires a much less quantity to produce the same effect; but it appears to interfere with digestion to a greater extent than smoking, and chiefly, perhaps, from its absorbing all the saliva as soon as it is secreted, in order to expel it from the mouth. It is said to be from the constant habit of chewing that the Americans are so devoid of fat, and so liable to dyspepsia; but as there are other causes which in themselves are sufficient to produce these effects, it is hardly fair to saddle them entirely on tobacco.

TOES, Treatment of diseases of the.—See *Bunions*, 391; *Corns*, *ib.*

TOES, Dislocation of the, 423; fracture of, 436.

TOE-NAILS, Cutting of the, 309; treatment of, when curving inwards, *ib.*

TOLU, Balsam of, 245.

TONGUE.—This organ is concerned in the functions of taste, speech, mastication, and swallowing. For these several purposes, it requires to be capable of free motion, elastic, and covered with a surface fit for the distribution of delicate nerves, to constitute the organ of taste. Its body is all muscle, with the exception of a bone (the *os hyoides*, see *Diagram of the Larynx*), which is like a small jaw behind the lower one, and to which the muscles are attached, so that it serves as a skeleton to the tongue itself. The surface of the tongue is covered by a dense mucous membrane, upon which are arranged *papillæ* of four different kinds and shapes. Thus, over the whole surface may be seen a number of conical papillæ, which are pierced by minute tubes, and are mucous follicles or small glands, having also the nerves of taste distributed to them. In addition to these, at the back of the tongue are some large *lenticular* papillæ, to the number of about fifteen or eighteen, which are also mucous follicles, and are arranged in the shape of the letter A. Behind these, again, are a number of larger mucous follicles; and irregularly dispersed over the surface are the *fungiform* papillæ, which are easily distinguished by their rounded heads and deeper red colour, especially in certain diseases, such as scarlet fever, or infantile remittent, when they become remarkably distinct.

TONGUE.—As a symptom of disease,

this organ has been long held up as the great and most trustworthy sign in most conditions of the system; but it must be accepted with considerable modifications, or it will constantly lead us into error. Thus, in some people, it is never altered under any circumstances; while some, though in fair health, never show a clean tongue at any hour of the day. It requires, therefore, a previous examination, in a state of average health, to enable any one to pronounce from the examination of the tongue, what conditions are made manifest by its present appearance. The following are the most common appearances, and the states which they indicate, subject to the above corrections:—

(*a*) *A furred* tongue, if *white*, indicates the first stage of fever, which may be of any of the kinds enumerated. *A thick whitish-brown fur, with the edges of the tongue red*, is seen in some forms of dyspepsia, and in the second stage of scarlet fever, but in this last the red is much brighter than usual. *A brown fur* over the whole tongue is present in habitual constipation. *A dry and dark brown fur* is a mark of typhoid symptoms.

(*b*) *A pale* tongue is a mark of anœmia, or of some forms of dyspepsia.

(*c*) *When the marks of the teeth are plainly visible* on the sides of the tongue, it may, as a rule, be assumed that there is congestive dyspepsia, with general want of tone.

(*d*) *When the mucous surface* is arranged so as to show cracks or fissures with a glistening red colour, there is usually a chronic form of gastritis.

(*e*) *A tremulous tongue* indicates disease of the brain or nerves, and especially approaching *delirium tremens*. It is seen in the later stages of fever when the brain is severely implicated, also in excessive debility.

(*f*) *A bright red* or *strawberry tongue* is seldom seen except in scarlet fever, and occasionally in infantile remittent. In typhus fever, as the tongue cleans, it is red, but not of the bright colour seen in scarlet fever.

TONGUE, Ulcers of the, 165; treatment of, 491.

TONICS, Nature of, 189, 341; formulas for, 341, 342.

TONSILS, Structure of, 108; disease of, *ib.*; treatment of, 453.

TOOTHACHE, Nature of, 165, 166; treatment for relief of, 491, 492.

TOOTH-POWDER.—See *Dentifrice.*

TOOTH-RASHES, Nature of, and treatment of, 287.

TOPS AND BOTTOMS for Infants, 284.

TORMENTIL, Properties of, 245.

TORQUAY.—See *Climate.*

TOUS-LES-MOIS.—See *Farinaceous Food.*

TOURNIQUET. — See treatment of *Hemorrhage* and *Diagram*, 477.

TOW-PLASTER, 264.

TRACHEA.—The tube leading from the *larynx* to the *lungs.* See the articles on these subjects.

TRACHEA, Inflammation of the, see *croup*, 51; treatment of, 304, 305.

TRAGACANTH.—A gum of a soothing nature, similar in its qualities to gum-arabic, and chiefly used in making the *compound powder of tragacanth*, composed of tragacanth, gum-arabic, starch, and sugar.

TRANCE, Nature of, 150; treatment of, 482.

TRAVELLING.—A means of relieving dyspepsia, congestion of the liver, and various nervous diseases. See articles on *Climate* and *Mineral Waters.*

TREMBLING (*Tremor*).—A sign of debility, especially of the nervous system. It is constantly manifested in some people of great excitability on the most trivial occasions.

TREPHINE.—A circular saw used in removing portions of the skull, when there is pressure on the brain from accident or disease.

TROCAR.—A pointed instrument in a sliding tube, used for *tapping.*

TRUSS.—See *Rupture*, 427.

TUBERCLE, Nature of, 133; in the brain, 138; in the skin, 72.

TUBERCULAR CONSUMPTION, Symptoms of, 135; nature, diagnosis, and duration of, 136, 137; treatment of, 470.

TUBERCULAR ERUPTIONS, Nature of, 71, 72; treatment of, 390.

TUMOUR.—By this term is commonly understood a chronic swelling occasioned by a *new* growth, and not a mere enlargement of a natural part, which is called *hypertrophy* (see that article). Tumours may be *simple* or *malignant*.

(*a*) *Simple tumours* may be of bone, 93, or cartilage, or lithate of soda (chalk stones, 88), or encysted, 162, or fatty, or aneurismal, 141, or of hydatids, 159.

(*b*) *Malignant tumours* comprehend scirrhus, or hard cancer, 160; soft cancer, 161, (otherwise called *fungus hœmatodes* or medullary sarcoma); jelly-like cancer, *ib.*; and melanosis, *ib.*

TUNBRIDGE WELLS.—A watering-place in Sussex, celebrated for its chalybeate springs. See *Climate* and *Waters, Mineral.*

TURKISH BATH.—A form of vapour bath, now frequently employed in London and other large towns. See APPENDIX.

TURMERIC PAPER is unsized paper soaked in a decoction of turmeric, and afterwards dried. It is used to detect the presence of alkalies, by its property of changing to a brown colour on being brought into contact with them.

TURPENTINE is the exudation from *pinus sylvestris* (the Scotch fir). In the state in which it is collected, it is called *common* or *horse turpentine*, which being distilled yields *spirit of turpentine* and *resin*.

TURPENTINE, Spirit of, 244; liniment of, 237; symptoms of poisoning by, 174; treatment of, 510.

TURTLE.—The flesh of the turtle is of a most nutritious character, and is admirably adapted for certain cases of disease, in which there is great debility of the stomach, as well as of the system generally. Turtle soup is generally too rich for this purpose; but the turtle is prepared and preserved expressly for invalids, and sold in tins from 3s. 6d. a-piece and upwards according to size. See *Preserved Meats.*

TURNIPS.—See *Vegetables.*

TYMPANITES, or *Drum-Belly*, is a symptom of great mischief in the stomach and intestines, usually showing itself in typhus and gastric remittent fever, in infantile remittent, and in inflammation of the bowels.

TYMPANUM.—See *Ear.*

TYPE.—This term is employed, in medicine, to designate the collection of symptoms which make their appearance in every attack of a particular disease, and by which it may at once be recognised. Thus, all the cases of typhus fever in 1856 may assume some different symptoms to those occurring as invariably in 1855 or 1857; and each of these variations, together with those always present in typhus, will make up the type of that fever in 1855, 1856, or 1857, as the case may be.

TYPHUS FEVER, Nature and symptoms of, 24, 27; treatment of, 352, 355.

ULCERS, Nature, varieties, and treatment of, 392, 395.

ULCERS, Scrofulous, 138; treatment of, 325.

ULCERATED SORE-THROAT, Treatment of, 453.

URETER.—The tube leading from the kidneys to the bladder, which it enters obliquely, so as to form a valve, preventing the return of the urine when the bladder is distended.

URETHRA (*the passage from the bladder*), Symptoms of inflammation of the, 56; treatment of, 380; treatment of spasm of, 450; of stricture of, 451

URINE, Nature of, 96; nature and cause of bloody, 105; symptoms of suppression of, 106; of retention of, *ib.*; of incontinence of, 107; of dribbling of, *ib.*; profuse flow of, 451.

URINE, Treatment of bloody, 449; of suppression of, 450; of retention of, *ib.*; of incontinence of, 451; of retention of, *ib.*; of diabetes, or immoderate flow of, *ib.*

URINOMETER.—An instrument intended expressly to measure the specific gravity of the urine.

URTICARIA (*nettle-rash*), Symptoms of, 61; treatment of, 384.

UTERUS.—The womb, 167 *et seq.* and 493 *et seq.*

UVULA.—The small central body depending from the palate between the tonsils. It is composed of muscular fibres, covered with mucous membrane.

UVULA, Relaxation of, 454; hypertrophy of, *ib.*

VACCINATION, Objects and progress of, 33 *et seq.*; operation of, 227.

VAGINA, Treatment of discharges from the, in children, 306.

VALERIAN, Properties of, 245; infusion of, 236; ammoniated tincture of, 245.

VAPOUR BATHS, 255.

VARICELLA (*chicken-pox*), 37.

VARIOLA (*small-pox*), 31.

VARIOLA VACCINA (*cow-pox*), 33.

VEAL.—See *Meat.*

VEGETABLES.—By this term is usually understood those edible productions of the vegetable kingdom, which are neither comprised under *Bread-corn* nor *Fruits.* They are especially useful from the large quantity of saline ingredients which they contain, and many of them also for their nourishing qualities; but they are not so easily digested by a weak stomach as fresh meat or bread, requiring a more complicated process than those materials, which nearly resemble the composition of the human body (see *Digestion*, 153, 154. The following list comprises the vegetables which are to be met with in their season in the markets and shops throughout England.

(*a*) *Vegetables for boiling*—as potatoes, cabbages, cauliflowers, brocoli, onions, turnips, carrots, parsnips, peas, broad-beans, French-beans, vegetable-marrow, artichokes, asparagus, sea-kale, and rhubarb.

(*b*) *Salads*—as radishes, lettuces, celery, endive, cucumbers, watercress, mustard-and-cress.

(*c*) *Herbs fresh and dried*—as mint, thyme, &c. Besides which may be enumerated,

(*d*) *Vegetables found in a wild state*—as mushrooms, truffles, &c.

(*a*) *Of vegetables for boiling*, *potatoes* form the staple in this country, being found upon the table of all classes, at all seasons of the year. Originally they came from Virginia, but now they are completely naturalised throughout Europe, and form a chief part of the food of the lower orders in this country, as well as in Ireland, and, to some extent, in Scotland also. *Starch* is the substance which forms the largest part of the solid materials composing the potato, being on the average 15 or 16 per cent.; while the remaining albumen, mucilage, and woody matter, together, only compose about 12 per cent. Of the raw potato, therefore, rather more than one-quarter only is solid nutritive matter, whilst the whole of the remainder is water, and consequently perfectly useless in the shape of food. Thus, while bread consists of water to the extent of one-fourth or one-fifth of its weight, the raw potato, which is often substituted for it, has nearly three-fourths of its weight of water, and is, besides, almost entirely deficient in nitrogenized principles, so that it requires an extra supply of animal food to be mixed with it, to that which will make oatmeal or wheaten-flour fit for the support of man. *Forced potatoes* are raised in hot-beds; the quality is not good, but always more or less watery. There is no reason whatever for their introduction to the table, except their scarcity and consequent high price. *Early or new potatoes* are those which first develop their tubers in the open air. They are more or less watery or waxy, as compared with the ripe potato, and are not very digestible to a delicate stomach; but to a strong one they form an agreeable variety, and they are sufficiently easy of solution to make them available without injury. As they are dug up before they are ripe, they do not keep many days, but they are better for being exposed for twenty-four hours. *The old or late potato* is the mature tuber, which is dug up after the stalks are dead, and stored for winter use. It is by far more digestible than the new or forced potato, and when "flowery" is tolerably well fitted even for a weak stomach, if the quantity taken is not too great.

Cabbages, cauliflowers, and brocoli come next to potatoes in point of general utility, the quantity consumed being enormous. From the large proportion of nitrogen which they contain, they are very useful in building up the muscular system, and they are therefore well fitted for those who take active exercise; but for delicate stomachs they are too strong, and produce flatulence and indigestion. The flowery parts of the cauliflower and brocoli are an exception to this rule, and they may generally be eaten with impunity by all but confirmed dyspeptics; but even in cauliflowers the stalk is full of nitrogenized matter, and liable to produce indigestion. *Summer cabbage* is very nourishing, and when well boiled tolerably digestible; it is a close-hearted cabbage, but it does not run to any great size. *Red cabbage* is grown for pickling only. *Savoy cabbage* is also close-hearted, but its leaves are very wrinkled, so that they do not lie upon each other like ordinary sorts. *Brussels sprouts* are the small secondary buds from a species of savoy, which are thrown out after the first heads have been cut, and they are largely used and highly prized by most classes in London, where they form a standing vegetable during the latter part of winter and the early spring. The *cauliflower* and *brocoli* are much alike, the chief difference to a casual observer being in the season during which each is prevalent. The *cow-cabbage* is now grown for the use of the poor of London, being in good condition throughout the winter, and sold at a very low price. It is, however, very rank in flavour, and only calculated for the strongest stomach, though full of nourishment. The *Scotch kales* and other kales, or curly greens, are in season during the winter, and serve to make a variety for those who are fond of green vegetables. *Spinach* is used in the same way as greens, and is an excellent variety of this sort of vegetable, being in season during the spring and early winter.

Artichokes, asparagus, and sea-kale form a group of delicacies which are only served to those who can afford to pay tolerably high prices for their vegetables. They are all very nourishing and digestible. *Artichokes* are of two kinds, separated from each other in the vegetable kingdom: one of them, the Jerusalem artichoke, resembles the sunflower and dahlia in its growth above ground, and produces tubers like the potato beneath the earth, which form the part used in cooking. They are sweet, nourishing, and mild, but the flavour is not universally admired. The *true artichoke*, the *asparagus*, and the *sea-kale* are eaten as delicacies; the two latter being considered peculiarly fitted for invalids. Sea-kale is always bleached under pots, and being an early vegetable, is prized on that account. Asparagus makes its appearance in the spring and is generally cut as soon as it shows its head, which is a great mistake, as the bleached part is always hard and stringy, while the green head is tender and full of flavour. It is, therefore, becoming more the custom to wait till the head is well above ground before cutting it, and then not to carry the knife far beneath the earth, whereby also damage is often done to other shoots.

Rhubarb is cultivated largely in a similar way to sea-kale, and forced in early spring under pots, for the sake of affording a material for puddings and tarts. It may, therefore, be considered rather as a fruit than a vegetable, which, however, it really is. The large giant-rhubarb is now a good deal out of favour.

its place being supplied by a smaller pink variety, which is full of rich juice, and makes better tarts, &c., than its gigantic rival.

Carrots, parsnips, and turnips are all roots of a somewhat similar character, though differing in form and colour. The two first are stored for use during the winter, and are much valued as vegetables, as also is the last; but the variety of it suited to the table will not keep long out of the ground, and it is therefore not to be obtained from the time that the frost sets in until May, when the younger turnips first come in. *Turnip-tops* also form a valuable green dish, when gathered at the proper age, and in the early spring. Those grown later than May are strong and scarcely fit for food. *Beetroot* is grown in England for human food, but it is eaten cold, more as a salad than as a vegetable.

Peas, beans, and vegetable marrow are seeds which are boiled in a green state, and used as vegetables, some without their pods, as the pea and broad-bean, and others with them, as the French-bean and vegetable marrow. They are all very nourishing, and some very digestible, as the marrow and French-bean; but broad-beans are very strong food, and so are peas, except when young. French-beans also ought to be used when young, and are hard and stringy at a later period. The white French-beans dried, called *haricots*, are used largely abroad, boiled and served as a vegetable; but they are not much liked in this country. Peas are, however, extensively used in a dry state for pease-soup and pease-pudding.

Onions, leeks, chives, &c.—Onions may be considered as a seasoning rather than as a vegetable, though sometimes stewed alone. They are grown to a great extent in this country, and also imported from abroad as *Portugal onions*, large, and free from strong flavour, and well calculated for stewing. *Young onions* are drawn for flavouring salads in the spring. The *leek* is closely allied to the onion, but has a small bulb, and is chiefly used for Irish stews, and by the Welsh in place of onions generally. *Garlic, chives*, and *shalots* are not extensively used in English cookery; but small quantities are sometimes introduced into made-dishes. All contain nitrogen and phosphorus, and are, therefore, useful to a strong stomach, affording essential elements for the formation of the body, but all are indigestible to a weak stomach.

(*b*) *Salads*, like many other articles of food are useful in health, but unfit for invalids, or for those whose digestion is not strong. *Lettuce* forms the chief component part of the salads of this country throughout the spring and summer. There is a great variety of lettuces now grown; but the two chief groups are the cabbage and the cos lettuce, the former coming into season in the early spring, the latter during the summer. The district round London is celebrated for its lettuces, and some are of a great size, and with a beautiful white heart and fine flavour. There is a considerable amount of anodyne power in them, which is sometimes useful when taken at night by bad sleepers. The lettuce is one of our most digestible salads, and very wholesome to those who are much confined to meat and bread, for whom it forms a useful change. The *endive* is a winter plant, and therefore of use as a salad at that time, but not equal in flavour to the lettuce. It requires bleaching, by covering up with an earthen pot, or storing it in a dark cellar, before it is fit for eating, as in the unbleached state it is highly bitter to the taste. *Radishes* are roots growing in two forms, the long and the turnip radish, much resembling the carrot and turnip in their form and composition, but containing a sharp and pungent fluid which renders them well fitted to stimulate the stomach to digest other food, and they are therefore used largely as an addition to it. They are wholesome to most people, though much too strong and indigestible for a weak stomach. *Horse-radish* is a different plant altogether, and only used to be eaten with roast-beef and some other kinds of rich food. *Celery* is extensively eaten as a winter-salad in this country, and, in the absence of lettuce, is valuable as the most easily procured of all those which will bear our winters. It is also stewed and eaten as a vegetable. *Cucumbers* are forced in hot-beds for those who can afford the price at which they are sold in the early season, but towards the end of the summer large quantities are brought to market which are grown in the open air and sold at a very cheap rate. They are, however, rather an indigestible food to most people, especially when eaten in large quantities as a corrective for rich diet, as salmon, lamb, &c. *Water-cress* and *Mustard-and-cress* are especially wholesome when young and tender; but the first of them is sometimes very old and tough before it is brought to market. Enormous quantities are grown near London in beds supplied with water for the purpose, and richly furnished with decaying animal and vegetable matter fit for its nourishment. Cresses are all highly antiscorbutic, and though not very nourishing, yet they freshen the stomach, and in that way do great good to the whole system. Their use should be encouraged, particularly for children brought up in towns.

(*c*) *Herbs* for seasoning, as is well known, are not eaten as a dish by themselves, but form parts of other dishes, in the shape of what is called seasoning, aided by some of those already alluded to, as onions, shalots, &c. It will only be necessary here to enumerate them as consisting of *parsley*, used also as a garnish; *fennel*, only for adding flavour to mackerel; *mint*, *sage*, and *thyme; marjoram*, sweet and knotted, and *basil;* also *capers, nasturtium, capsicums*, and *tomatoes*, which are grown to be used as a means of flavouring sauces when preserved in vinegar, and therefore to be considered rather as pickles than herbs. The quantity used is seldom sufficient to make them unwholesome, except to very delicate stomachs.

(*d*) *Among wild vegetables*, mushrooms are the most generally used, and as there are several poisonous fungi very similar to them, it is important to ascertain the peculiarities by which they may be known. All the FUNGI are very different in their modes of growth from the ordinary classes of vegetable substances, and also very much among themselves in size, form, colour, and consistence. Of these many are commonly called mushrooms; but the true edible mushroom (*agaricus campestris*, Linn.) has distinctive features which will presently be described. Fungi, in general, have a form more or less resembling a parasol, some are globular, others membranaceous, tuberous, or froth-like. They are found of all colours, except green, but the prevailing hue is a greyish white, or yellowish pink. Their consistence is fleshy, spongy, gelatinous, cork-like, or woody, but never herbaceous. They have neither leaves nor flowers, and in their anatomical structure they consist entirely of cells, either of a rounded or oblong shape. When arrived at maturity, they all present minute coloured globules, which are their buds, or reproductive organs, analogous to the seeds of other vegetables. These globules are found internally, as in the truffle and puff-ball, or covering the entire surface, or in laminæ on the under surface, as in the mushroom, or at the openings of tubes in furrows or capsules, or sometimes floating in mucilaginous matter. Between two and three thousand fungi are now described, grouped into nearly one hundred genera. Almost all fungi are rapid in their development, and in this respect exceed other vegetable substances. They delight in moist shady places, and grow on animal and vegeatble bodies in a state of decomposition, some even being developed within the substance of living vegetables. All have a peculiar odour, by which they may be recognised, and their taste is generally insipid, but sometimes acrid, styptic, or caustic; or, again, as in the edible mushrooms, very agreeable to the palate. Many species have long been used for food in China, India, and Africa, and more recently on the continent of Europe, particularly in Italy, where they are consumed in very large quantities, and cultivated to an enormous extent, one layer succeeding another so as to afford a constant supply. Many fungi are exceedingly poisonous, producing nausea, vomiting, giddiness, convulsions, and sometimes death itself. If, therefore, it is suspected from these symptoms that a mistake has been made, it is better in all cases to give an emetic without loss of time, and thus eject the contents of the stomach (see 511). *The common mushroom* (*agaricus campestris*) is found in rich open pastures, especially in those where horses have grazed in the previous year. It is distinguished from the poisonous kinds by having an upper smooth surface, whose cuticular covering readily peels off, leaving a fibrous substance beneath. This upper surface is white in the young mushroom, and more or less brownish in the full grown one. The under part is a radiating series of laminæ, which are pink in the young mushroom, and become light-brown, and afterwards dark-brown, as the mushroom becomes full-grown. The whole is supported upon a short and thick foot-stalk, varying in length from a quarter of an inch to two inches, or rather more. In shape the mushroom commences with a resemblance to a nodule of baker's dough, nearly round and smooth. This gradually expands below like the opening of a parasol, but more round and doughy, until it has spread out into the shape and size of a plate, frequently being eight or nine inches in diameter. This species is cultivated in our gardens by the use of what is called *mushroom spawn*, which is nothing more than rotten dung, and other similar matters compounded together, and kept for a year, until it has had time to develop the fungoid globules, when it is planted in hot-beds, and in process of time the mushrooms make their appearance. They are, however, inferior in flavour to the wild sorts, and the only advantage in using the spawn consists in the early appearance of the mushrooms, and the avoidance of danger in the gathering of false fungi by mistake for the true ones. The large full-grown mushroom is used for making ketchup, the middle size for stewing or broiling, and the small ones, called " buttons, " for pickling. The champignon (*agaricus pratensis*, Linn.) is very similar to the common mushroom of small size, in all respects except in the colour of the *laminæ*, which are cream-coloured instead of pink. They are, however, so very liable to be mistaken for the poisonous kinds of fungi popularly known as *toad-stools*, that they are seldom ventured upon in this country. They grow wild in dry upland pastures, especially in parks. The truffle (*tuber cibarium*) is remarkable for its peculiar mode of growth underground, at the distance of a few inches from the surface. When arrived at maturity it becomes gelatinous, and gradually dissolves away. There are several species, of which the common truffle only is eaten in this country, and is said to be found in some few situations in England, though not to any extent, those which are eaten being imported from abroad. The morel (*phillus esculentus*) is another species of fungus, found in the fields and woods in the spring and early summer. It is of an egg-shape, hollow, and raised on a foot-stalk. The colour is yellowish-brown; but, like the champignon, they are so liable to be mistaken for poisonous fungi, that it is dangerous to indulge in them without great care in their selection. The chemical components of all the fungi are nearly the same, being remarkable for the amount of nitrogen which they contain. From this circumstance they are very valuable to the poor who are deficient in meat, milk, and other nitrogenised compounds.

Several marine vegetable substances are eaten in particular localities, but more as popular medicines than as articles of food. It is unnecessary, therefore, to allude to them further than by name—as *sweet tangle*, *laver*, *badderlocks*, and *carragheen* or *pearl moss*, which last is confined to Ireland, and extensively used there in consumptive cases among the poorer classes. See 248.

The common nettle, which is universally met with, is really a very valuable kind of food when gathered at the proper age and boiled. In March and April, the tops are young and tender, and should be cut before they show any flowers, as after this they are strong in flavour and stringy in texture. When boiled like spinach, or added to soup, they are a very agreeable addition to the ordinary fare, and far better than the inferior qualities of cabbage.

The dandelion is used in France to a great extent as a salad, for which purpose its young leaves are cut and mixed with other plants, as sorrel, &c., and there is no doubt that they form a good alterative.

The sorrel grows wild in all our meadows, but is almost wholly neglected in this country, being in fact a somewhat different plant to that which is so much prized in France. It is useful as an anti-scorbutic.

VEINS.—The tubes which return the blood from the small arteries to the heart. They are thin in their coats, which have very little contractile power, and in the extremities are supplied with valves at short intervals so as to prevent the retarding effort of a column of blood.

VEINS, Inflammation of (*phlebitis*), 141; varicose, 143; hemorrhoidal, *ib.*; treatment of, 473; treatment in pregnancy, 496.

VENEREAL DISEASE.—A disease contracted from impure connection. See *Secondary Symptoms*.

VENESECTION.—The opening of a vein to procure blood. See *Bleeding*.

VENISON.—The flesh of the fallow or red deer, resembling mutton in all respects as regards digestion and nutritive qualities.

VENTILATION, Necessity for, 7, 8; of a sick room, 253, 338.

VENTRICLE (see *Heart*).—The term is also applied to certain cavities in the brain.

VERDIGRIS, Symptoms of poisoning by, 174; treatment of, 509.

VERMILION, Symptoms of poisoning by, 173; treatment of, 509.

VERTEBRA.—See *Skeleton*.

VERTIGO.—See *Giddiness*.

VESICATION.—The production of a *blister*.

VESICLE, Nature of, 61.

VESICULAR ERUPTIONS, 61; treatment of, 384.

VINEGAR.—See *Fermentation*.

VINEGAR WHEY, Preparation of, 250.

VITRIOL.—See *Sulphuric Acid*.

VITRIOL, Blue — (see *Sulphate of Copper*), symptoms of poisoning by, 174; treatment of, 509.

VITRIOL, White. — See *Sulphate of Zinc*.

VIPER, Bite of.—See *Wounds*, 400.

VISCERA.—The organs contained in the chest and abdomen.

VISION.—See *Eye*, *Anatomy of*, and *Spectacles*.

VOICE.—The human voice is produced by the co-operation of the lungs, larynx, tongue, mouth, nose, and lips. When, therefore, it is deficient in any of its essentials, one or other of these organs is in fault.

VOMITING.—See *Sickness*.

WALNUTS (see *Fruit*), medical use of, as a cathartic, 245.

WARMTH, Artificial production of, 6; degree of, for a sick room, 253, 338.

WARM BATH.—See *Baths*, 254, 255.

WARTS, Nature of, 72; treatment of, 390.

WASHING of Infants, 281; of children, 289.

WASP STING, Treatment of, 400.
WASTING.—See *Atrophy*, 137.

WATER, when pure, is composed of two gases, oxygen and hydrogen, as may be demonstrated by burning them together in a closed vessel, the product being an amount of water exactly equal in weight to the gases previously existing. It may also, by the galvanic battery, be resolved into its gaseous elements; and in all gases it is composed of the same definite proportions of them—viz., oxygen by weight, eight parts; hydrogen, one—or by volume, oxygen one, hydrogen two. Water is converted readily into vapour, called steam, which process, under ordinary circumstances, is called drying. By increased heat the steam is raised in temperature to a high degree, and will burst any known material used to confine it if the heat is sufficient. By diminishing or abstracting heat, commonly called cooling, the steam becomes again pure water, and by going on still further, ice, in which last process it also expands considerably. It boils at 212 and freezes at 32 degrees Fahrenheit. It is a very slow conductor of heat and electricity, and is almost incompressible. Water has a great tendency to absorb gases, and hence its presence in cisterns is frequently a means of warding off the deleterious effects of cesspools, &c. It is in this way that a pan of water will remove the smell of paint, and that it is able to contain so large proportion of carbonic acid gas in some cases, or of simple atmospheric air in others, causing the water to taste "fresh" or "brisk" to the palate. One hundred cubic inches of recently-boiled water, at the mean temperature and pressure, absorb of

	Cubic inches.
Sulphuretted hydrogen	100
Carbonic acid	100
Nitrous oxide	100
Olefiant gas	12·5
Oxygen	3·7
Carbonic oxide	1·56
Nitrogen	1·56
Hydrogen	1·56
Atmospheric air	

All these gases are easily and entirely expelled by boiling the water, which accounts for its vapid taste when drunk as soon as cooled. Water is a solvent of most substances in nature in some proportion or other. It has a strong affinity for the acids, the more powerful of which can scarcely be obtained perfectly free from its mixture. It also has a strong attraction for the fixed alkalies and alkaline earths, and enters into the composition of all the compound salts, even in the case of those which are insoluble in it. It exerts a chemical action on most of the metals, some at the temperature of our air, as iron, potassium, &c., and others only at a higher degree. From these causes it seldom exists in nature without holding some foreign substances in solution, many of which are perfectly innocuous, and, indeed, advantageous to life, whilst others are highly injurious. *The specific gravity* of other bodies is denoted by their difference from the weight of water; and this being the most common fluid in nature, and its weight being also readily calculated, because a cubic foot of it weighs nearly 1000 ounces avoirdupois, it is selected as the standard for comparison. A cubic foot of water at 60 degrees Fahrenheit, and with the barometer at 30 inches, weighs 998.217 ounces avoirdupois; hence, if we know the specific gravity of any body, we have very nearly its weight in ounces avoirdupois, which is a great convenience to the calculator.

For medical purposes water may be considered under the heads of (*a*) distilled water; (*b*) spring or river water; and (*c*) sea water.

(*a*) *Distilled water* is perfectly pure, being obtained by the distillation of any ordinary kind of water, not impregnated with volatile substances. *Rain-water*, when carefully collected and stored, is pure, with the exception of containing a trace of ammonia. For this reason it is well adapted for baths, and for general ablution; but it is too often contaminated by the dirt on the house-tops, and by decayed leaves, &c., which are suffered to collect in the spouting.

(*b*) *Well or spring water* is generally *hard*—that is to say, it is impregnated with numerous earths and saline substances in solution. It is derived from the rain water percolating the various strata, on the surface of some of which it is collected and stored up, whilst from others it runs in the shape of springs, which well up from the earth, in consequence of the pressure of a head of water above their level. In their progress through these strata they acquire the salts which they contain; but as they are removed from the contact of light and air, they are not contaminated by the presence of vegetable or animal beings, nor do they usually hold dead animal or vegetable substances in suspension. They are, in fact, more pure than any other water but clear rain or distilled water, and hence they are highly prized for drinking, though they are generally too hard for washing, brewing, boiling, &c. The degrees of hardness are indicated by numbers from 1 to 60 degrees, which latter is an extreme degree of inorganic impurity. *River and pond waters* are similar in their mineral compositions to well and spring waters; but they often contain decaying vegetable and animal bodies brought into them from the surrounding soil.

(*c*) *Sea water* consists of the following salts mixed with water—viz., lime, magnesia, and soda, and also sulphuric and muriatic acids, with small quantities of iodine and bromine . The proportion of salts being 1 in 30, or thereabouts , consequently, sea water is very hard and very unfit for domestic purposes. By distillation a tolerably pure water may be obtained, but still containing some little quantity of muriatic acid, which is higbly volatile. For external use in bathing, it is however highly beneficial, being exceedingly bracing, in consequence of the salts which it contains, and also alterative, from the iodine and bromine which enter into its composition. See *Sea-Bathing.*

WATER, Impurities of.—Water is capable of being contaminated by inorganic as well as organic substances, both of which, to a varying extent, render it unfit for the use of man.

(*a*) *The inorganic impurities* are either suspended by water in motion, from which they are deposited when at rest, or else they are in solution. In either case they are alkaline, earthy, or metallic. Those in suspension are chiefly of a clayey or sandy nature; and although they interfere with the appearance of the water, yet they are in reality very slightly injurious in their effects on the animal economy. The substances in solution are those earths, alkalies, &c., which are dissolved in river and well water, together with the salts of lead and iron, which the water receives from the vessels in which it is contained. The first of these will be found to vary considerably in the quantity found in well and river water, and to be almost entirely absent in rain water. Lead in solution is caused by the action of water on the pipes and cisterns containing it. Dr. Hassall, who has done so much in other departments of the supply of food, has recently made a series of experiments on the subject, and the results to which he arrives are as follow :—

1st.—That lead in contact with water is oxidized in at least two, if not three, ways—through the oxygen of the air; through the decomposition of certain substances present in water which contain a large quantity of oxygen, as the nitrates ; and probably in some instances, by the decomposition of water itself.

2nd.—That the oxide formed in these cases is the hydrated oxide, a compound sparingly soluble only in water, but which readily enters into combination with any free acid present; the ordinary acid contained in water being the carbonic, with which the oxide will form either a soluble or insoluble salt, according to the amount of acid existing in the water.

3rd.—That as pure distilled water, freed as far as practicable from oxygen, and enclosed in a sealed vessel, acts quickly and energetically on lead, the action depending most probably upon the decomposition of the water; rain, snow, or other water free from gaseous or saline impregnation, and thus closely resembling distilled water, acts in a similar manner. It is to be remembered, however, that the compound formed is the hydrated oxide of lead, which is but little soluble.

4th.—That in distilled water also included in a sealed vessel, from which the oxygen has been expelled by boiling, carbonic acid being subsequently passed into it, a soluble carbonate of lead is readily formed, the salt in question being generated still more quickly and abundantly when oxygen as well as carbonic acid is freely added to the water.

5th.—That while dried carbonate of soda does not act injuriously on lead, crystallized carbonate of potash, the carbonates of magnesia and lime, and the alkaline or neutral bicarbonates of the same, exert a marked solvent action.

6th.—That solutions of the caustic alkalies, soda and lime, act in a most energetic and destructive manner on lead.

7th.—That while chloride of calcium exerts little or no effect, chlorine and chloride of sodium act very decidedly.

8th.—That certain salts, as sulphate of potash, phosphate of soda, and some others, principally sulphates and phosphates, appear to exert a protective influence on lead, as is shown by the slight oxidation of the metal, which takes place when these salts are dissolved in distilled water.

From these facts Dr. Hassall also comes to the conclusion, that rain water cannot with perfect safety be stored in lead cisterns, but that the salt formed is only sparingly soluble, especially when exposed to the air. He also considers that water impregnated with free carbonic or any other acid, as indicated by exhibiting an acid reaction, cannot be stored or conveyed in lead without great risk. Water also containing any of the following salts, he thinks unsafe when stored in lead—viz., carbonate of potash, magnesia or lime, or any of the alkalies or earthy bicarbonates or nitrates, when in considerable quantity. *The galvanic action* is also going on to a considerable extent in lead, and particularly on the bottom of cisterns, which are always corroded much before the sides, and also on the soldered joints, where two metals conspire to produce the galvanic current. *The admission of the atmosphere* is the most potent cause of all under ordinary circumstances, because of its permitting the free access of oxygen contained in it, and thus increasing the amount of oxide. Hence, the intermitting supply which admits air into the pipes is much more injurious than that at high pressure with a continuous stream.

(*b*) *The organic impurities* consist of dead animal and vegetable substances, such as decaying leaves, water-plants, and also dead animals, large and small, which give off carbonic acid, carburetted, phosphuretted, and sulphuretted hydrogen, ammonia, and nitric acid; also, of living animal and vegetable productions, as fish, worms, larvæ of insects, and animalcules, as well as the algæ, or fresh-water plants. These are all rapidly developed under certain circumstances peculiar to each; some being the denizens of stagnant ponds, whilst others are peculiar to running waters. Deep wells, without the admixture of drainage water, are free from all these sources of impurity; and next to them comes the water of quickly running streams. Ponds, reservoirs, and cisterns are all prone to their development, and in proportion to the infrequency of the change in the water they contain. These living organic impurities cannot be considered as making the water more impure than before, but rather as indices of an amount of impurity requiring their presence as natural scavengers to get rid of it, which office they effect by absorbing into their systems and assimilating to their living substance the decomposing matters which would otherwise speedily be converted into those injurious gases which are enumerated above.

(*c*) *The chief tests* for discovering these various impurities in water are as follows:—

1. For the discovery of *sulphate* or *carbonate of lime* or *magnesia*, add a few drops of a solution of nitrate of barytes, when the fluid will become turbid, which turbidity, again, will be removed by the addition of a drop or two of pure nitric acid.

2. For the *muriates*, add a solution of nitrate of silver to the previously tested solution, which gives a bluish precipitate.

3. The *sulphates* or *carbonates* are also indicated by the turbid appearance on the addition of a solution of acetate of lead, which has little or no effect upon the muriates of lime, &c.

4. *Sulphate of lime* is also detected by what is called *the soap test*, which is applied by means of a solution of soap in alcohol; when the sulphate exists in an undue degree, causing the water to be hard, it throws down a curdy precipitate, which is in proportion to the quantity of lime.

5. *Magnesia* is indicated when a milkiness is the consequence of adding a solution of phosphate of soda to water, which has previously been treated with carbonate of ammonia.

6. *Free carbonic acid* is detected by a milkiness being produced on the addition of an equal proportion of lime-water, or by adding a small quantity of the super-acetate of lead.

WATER, Purification of.—Those matters which are merely suspended in the water, such as coarse mineral substances, and undissolved vegetable and animal fibres, may readily be removed by the use of a filter, of which many sorts are offered to the public, and most of them capable of doing all which such a mechanical means can accomplish; but the saline solutions, and also much of the dissolved vegetable and animal matters pass through unchanged. It is important, therefore, to health, that the water used should be originally pure, and that no reliance should be placed upon a filter accomplishing the purification of water, which is loaded with substances held in *solution*. Such a belief only leads to error, and often is the source of diseases which sap the health and strength of whole families, and even larger communities. On the other hand, the improvement in health consequent on the use of pure water is no less remarkable as is exemplified in London and its suburbs since the disuse of the foul water, which was formerly distributed without the slightest attempt at purification. There is now in all parts of London, a good wholesome "water-supply," not perfectly pure, but fit for all the ordinary purposes of life, and the health of the inhabitants rises in almost exact proportion to the purity of the water which they receive, and which seems to affect them still more than the nature of the air which they breathe.

WATERS, Mineral.—Natural springs, containing a sufficient quantity of saline matter to affect the taste or smell, have long been known by the above name. They occur in all countries with which we are acquainted, and have been celebrated from the earliest times for their efficacy in the cure of many diseases, chiefly, however, of a chronic character. In the middle ages, they were completely neglected by Christians, the use of them being considered to be a mark of heathenism, and, though partially revived by Charlemagne in the ninth century, they scarcely ever recovered their ancient celebrity until the fifteenth, since which they have been gradually reaching their present fashionable position in public estimation. In England "watering-places" have been celebrated since the time of Charles II., when Bath began to attract attention; and in the same reign, Buxton came also into fashion, both being shortly succeeded by Scarborough, Tunbridge Wells, and a long list of places which have since become famous. About the same time, also, the various countries composing the Continent of Europe had each their favourite mineral springs, which have lately attracted the English to the neglect of their own. The salts most commonly found in mineral springs are the following:—

1. The *chlorides* of sodium, calcium, and magnesium in great abundance.

2. The *sulphates* of potass (rarely), soda, lime, magnesia (all in abundance), and alumina (rarely).

3. The *carbonates* of potass, soda, lime, and magnesia in abundance, and strontia in small quantities.

4. *Silicates* in small quantity.

5. The *nitrates* of potass and magnesia in moderate quantities.

6. *Acetate* of potass is occasionally met with in considerable amount.

7. *Iodides* and *bromides* of potassium and sodium are met with in very minute quantities.

8. *Iron* chiefly in the form of the oxide and sulphate, constituting what are called "*chalybeates.*"

9. *Sulphur*, showing itself in the form of sulphuretted hydrogen gas, and giving the name "sulphureous" to its springs.

10. *Arsenic* in minute quantities is now ascertained to exist in many waters, which are, therefore, taken in preference to the mineral in medicinal doses, for diseases of the skin.

11. *Carbonic acid* occurs to some extent in many waters, but in some it exists to such an amount as to cause them to be called "*acidulous.*"

12. Lastly, *heat* is sometimes developed to such an extent as to give the waters containing it the name of "hot" or "warm," or sometimes "thermal" springs.

Artificial mineral waters are easily made to imitate very closely any of the natural springs in existence; but, either from some defect in the chemical manipulation, or more probably from the want of the adjuncts afforded by faith, and amusement of the body and mind, which are in league with modern watering-places, these substitutes are useless, and are neglected by the universal consent of mankind. In the present day, the baths of Germany enjoy the patronage of all those who can afford to indulge in them, and though many inconveniences must be put up with, in order to participate in their enjoyment, yet it cannot be denied that in most respects they excel our native establishments, and from being confined to those English who can spare both time and money, they are not so "common and vulgar" as English localities, which can be reached by an expenditure nine-tenths less than that required by their foreign rivals. But as I fully believe that the efficacy of mineral waters is in great measure attributable to the accessories, *if the partakers can only contrive to occupy and amuse themselves*, the English will answer the purpose quite as well as the most fashionable, and therefore inaccessible, spa in Germany or France, in spite of the contempt of Docteur Constantin James, whose recent "*Guide Pratique*," to the use of French and other continental waters, is now so constantly quoted in disparagement of our fallen reputation, as far as our own country is concerned. The truth really lies in the fact, that the farther off the spa is, the more time and trouble it takes to reach it, and *by so much* is it more useful; so that, very often the invalid is half cured by the journey necessarily taken to reach his object. Those who live at watering-places never take the waters, finding by experience that they do them no good, because to them there is no attendant novelty and amusement. But it cannot be denied, that with every advantage mineral waters are very efficacious in the removal of many chronic diseases; so that, whether it is from their mineral ingredients, or from the accessories above alluded to, or from all combined, they are well worthy the attention of those who are unfortunately afflicted with such diseases as are commonly found to be relieved by them—including dyspepsia, rheumatism, gout, paralysis, liver-complaints, constipation, neuralgia, anœmia, chlorosis, chorea, epilepsy, and other diseases commonly known as "nervous." The waters containing sulphate of magnesia and soda, and which are, therefore, aperient, are chiefly used in dyspepsia, rheumatism, gout, and liver-complaints; those which contain iron are confined in their sphere of operations to anœmia, chlorosis, neuralgia, and similar diseases; while the sulphureous waters are devoted to skin diseases, together with those containing arsenic. Lastly, the "thermal" waters are used externally in the cure of rheumatism and paralysis.

(*a*) *The following are the chief saline aperient* mineral waters of Great Britain and the Continent:—

1. CHELTENHAM contains six springs, five of which are saline aperients, and the sixth contains common salt, with chloride of calcium, sulphate of soda, and oxide of iron.

2. LEAMINGTON has eleven springs, all of which are saline aperients; but two or three, like the Cheltenham chalybeate, contain iron.

3. SCARBOROUGH contains two wells, called *north* and *south*, both impregnated with sulphate of magnesia, lime, chloride of sodium, and magnesia; but the north has, in addition, common salt—and the south, carbonate of lime.

4. DUMBLANE, in Scotland, is famous for its saline springs, which are very similar to those of Cheltenham.

5. INVERLEITHEN, near the Tweed, is famous for a spring containing a large proportion of common salt, chloride of calcium, and carbonate of magnesia.

6. SEIDLITZ, in Bohemia, has a very powerful aperient spring, containing sulphate of magnesia, soda, and lime, carbonate of magnesia, and lime, with carbonic acid gas in great quantities.

(*b*) *Chalybeate Mineral Springs:*—

1. TUNBRIDGE WELLS possesses springs which contain protoxide of iron, with common salt, sulphate of soda, chloride of calcium and magnesium, and carbonate of lime. In addition to which, it is impregnated with carbonic acid gas, and a small proportion of oxygen and nitrogen.

2. CHELTENHAM and LEAMINGTON have been already alluded to, and BATH has likewise a chalybeate spring, but not containing a large proportion of iron. HARROWGATE, also, and many other places are similarly situated.

3. HARTFELL SPA, in Scotland, contains sulphate of iron and alumina, with nitrogen gas in one spring, and a sulphated peroxide of iron, with sulphate of alumina and free sulphuric acid in the other Neither of them are much frequented

4. SPA in Belgium has long been famous for its chalybeate springs which, in addition to the iron, contain sulphate of soda, common salt, and carbonate of lime and magnesia.

5. RENNES, in the south-west of France is another well-known chalybeate spring.

6. SCHWALBACH, in Germany, contains in its springs rather less than the usual amount of iron; but there is combined with them a large proportion of carbonic acid gas. This water has obtained great celebrity on the Continent in anœmia, chlorosis, leucorrhœa, and sterility, as well as in general debility.

7. KISSENGEN resembles Cheltenham in the properties of its waters, and has no superiority over that place, in any respect of which I am aware, except in the greater distance from England, and consequently increased difficulty of reaching it.

(*c*) *Sulphureous Waters.*

1. **Harrowgate** is chiefly celebrated for its springs, containing sulphuretted hydrogen gas, together with chlorides of sodium, calcium, and magnesium. They have long been used extensively in diseases of the skin, and are taken internally as well as employed externally.

2. At **Moffat** and **Strathpeffer**, in Scotland, sulphureous springs exist; but they are not much used.

3. **Bareges**, in the Hautes Pyrénées, contains a sulphureous spring, but is not very strong in its composition, nevertheless enjoying a high reputation.

4. **Aix-la-Chapelle**, near Cologne, and **Aix**, near Geneva, have both for a long time enjoyed most extensive reputations for the efficacy of their sulphur springs, which are rich in the extreme. They are chiefly used externally, but even in that way they are strong enough to produce a considerable degree of fever. Skin disease, rheumatism, and gout are the diseases for which they are chiefly famous.

5. **Biarritz**, in the Pyrenees, is another sulphureous spring, very similar to that of Baréges, and besides this there are several others in the same district.

(*d*) *Acidulous waters*, characterized by the presence of carbonic acid gas and their acid taste, are found at:—

1. **Pyrmont**, in Westphalia, which is also celebrated for its thermal springs.

2. **Seltzer** water contains, in addition to the carbonic acid, common salt and carbonate of soda, lime, and magnesia. Seltzer is on the Rhine, between Frankfort and Coblentz.

3. **Vechi**, in France, is a well-known acid spring, somewhat resembling that of Seltzer in its composition.

4. **Ems**, in the Duchy of Nassau, is among the most fashionable watering-places of the present day. Its springs, which are numerous, are all chiefly indebted to the carbonic acid which they contain for their freshness and palatability. They have enjoyed great celebrity in pulmonary affections, chiefly derived from the patronage of the Empress of Russia; and they are, also, considered useful in dyspepsia and congestion of the liver.

(*e*) *Thermal, or hot-springs:*—

1. **Matlock**, in Derbyshire, has a warm spring of *pure* water, flowing at a temperature of about 66° F.

2. **Clifton**, near Bristol, is celebrated for a spring flowing at a temperature of 74° F., and containing magnesia, common salt, soda and lime in small quantities, as well as carbonic acid gas.

3. **Buxton**, in Derbyshire, possesses a warm spring, flowing at a temperature of 80° F. It contains, also, sulphate of soda, common salt, chloride of calcium and magnesium, and carbonate of lime. It is chiefly used as a bath for rheumatic and paralytic affections.

4. **Bath**, in Somersetshire, has three hot-springs. The hot-bath, 117°; king's bath, 114°; and cross bath, 110° F. When first drawn, the water is clear, but soon becomes turbid, with a yellow deposit. It contains sulphate of lime, common salt, sulphate of soda, carbonate of lime, silica, and a trace of iron. Carbonic acid gas is also present in considerable volume. The water is abundant, and the baths are so large as to be taken gregariously. They are chiefly useful in paralysis, gout, rheumatism, neuralgia, and general debility.

5. **Carlsbad**, in Bohemia, contains several well-known thermal springs similar to those of Bath, but hotter and more loaded with mineral elements.

6. **Baden-Baden** is one of the most celebrated of all mineral springs; but it is more for its general amusements and other attractions, than for the virtues of its hot-baths, which are far below the average in point of utility.

7. **Plombierres**, in the east of France, is now enjoying the patron-

age of the Emperor Napoleon, and for that reason is fashionable among those who follow royalty in all its freaks and whims. Its waters are slightly mineralized, containing carbonate of soda, lime, and magnesia, sulphate and chloride of soda, and silicate of soda. These elements give the water a soapy feel to the skin, and render it soft after bathing.

8. **Wiesbaden**, in Germany, has fourteen warm springs, varying in temperature from 117° to 151° F.

(*f*) *Miscellaneous springs*, containing arsenic, iodine, &c., and chiefly useful in diseases of the skin :—

1. **Gastein**, near Sallzburg, in Austria, has lately become somewhat famous for an arsenical spring.

2. The water of **Wiesbaden** is also said to contain arsenic and iodine in very small quantities, according to the analysis of M. Walchner.

3. **Vichi** and **Bagneres** are likewise supposed to possess arsenic held in solution in their waters.

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WATER-CURE.—See *Hydropathy.*

WATER IN THE CHEST. — See *Pleurisy.*

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WEN.—A term which is used for soft tumours in the neck.

WHEATEN Flour and Bread.—See *Flour and Bread.*

WHEY.—See *Milk* and *White Wine Whey*, 249.

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WINES, Medical, 245; as wine of colchicum, *ib.*; of ipecacuanha, *ib.*; of iron, 246; of aloes, *ib.*; of antimony, *ib.*

WINE is generally defined to be the fermented juice of the grape, and this description is sufficient for all foreign wines; but there are also some of British growth or manufacture which have nothing to do with that fruit, but are the result of the fermentation of some other saccharine matter—as, for instance, currant and gooseberry wine, elderberry-wine, ginger-wine, rhubarb-wine, malt-wine, &c. The above definition must, therefore, be confined to *foreign* wines. It is contended by the advocates of total abstinence from alcoholic drinks, that wine, or the fermented juice of the grape, is a modern invention, unsanctioned by Scripture, and unnecessary to man; but this hypothesis is utterly untenable; and though it would take some space to refute it, yet there is no doubt that it is capable of as complete a contradiction as is the assertion, that black is white, or white black. Indeed, as they do not deny that the juice of the grape in some shape was used, they almost admit the fact, because it is well known that new and old wine were both recognised by the Romans, and also by Christ himself; and, therefore, if *old*, it must have been fermented, because, in wine, this process takes place without any adventitious aid. Supposing, therefore, that the wine mentioned in scripture was fermented, we have full authority for its use, though of course there is none for its abuse.

When *must* is put into a suitable vessel, at a temperature of fifty-five to sixty degrees of Fahrenheit, a gradual fermentation ensues as a natural consequence of the presence of vegetable albumen in the grape• bubbles of carbonic acid gas are evolved, and rise to the surface, bringing with them much of the refuse or dregs, which accumulate into a thick, spongy, and firm crust, covering the whole liquor. After a certain time the crust breaks into fragments and falls to the bottom, which is a sign that the fermentation has proceeded far enough, and it is therefore checked by racking into casks and bunging them carefully, after removing them into a cool cellar. The effects of fermentation are similar to those produced in malt liquor, much of the saccharine matter is converted into alcohol, and the remainder is pleasant to the palate, with just enough sweetness to be agreeable. It is mainly upon the degree to which fermentation is carried that the flavour of the wine depends, though the kind of grape and the nature of the soil and climate have also their proportionate effects. From the development of alcohol, the effect upon the brain—in occasioning excitement, and, in large quantities, drunkenness—is produced, by which all spirituous liquors are distinguished; while there can be no doubt that any quantity of must, or unfermented wine, may be swallowed with perfect impunity, as far as intoxication is concerned. But even after the wine is stored in the casks a slow fermentation still goes on, by which the mucilaginous particles and the tannin and woody matter, as well as the tartar, are thrown down in the shape of what is called *lees*. In this slow change, the taste of the wine becomes more refined, and the harshness disappears, which was due to the presence in solution or suspension of the above ingredients. But if the first fermentation has not been fully performed, the second is also interfered with, and the wine continues turbid, emits bubbles, and sometimes breaks the containing vessel, as in the sparkling wines, in which this is purposely effected, but with great care, to avoid over-doing it. If, on the other hand, the first fermentation has been carried too far, the wine is liable to run on to the acetous fermentation, which is very slow and insensible, but surely begins as soon as the alcoholic stage is concluded, if not checked by artificial means. Acetic acid once formed cannot be altered into any other useful product, and the wine-grower is compelled to conceal its presence by converting it into a neutral salt, adding for that purpose an alkali or alkaline earth, or, in some cases, lead, which unites with acetic acid to form the acetate of that metal, a salt which has a *sweet* taste, not disagreeable to the palate, and without much effect upon the colouring matter of the wine, while at the same time it retards its fermentation and putrefaction. Hence, its use has always been adopted by those who either are ignorant of its baneful effects upon the human system, or are reckless of the consequences. The alkalies, on the other hand, destroy the red colour of wine, changing it to a dark olive, and producing a disagreeable effect upon the flavour, so that they are never adopted except with the white wines.

Wines are red when the black grape with its skin has been employed in their manufacture. The white grape makes a light yellowish-brown wine, and the black grape freed from its skin, one of a similar colour, but rather darker. The first great sub-division is therefore into *red* and *white*. Another, entirely independent of the first, is into *astringent* or *dry wines*, including hock, claret, Bucellas, Moselle, Burgundy, champagne, sherry, and Madeira; and *sweet wines*, as Malaga, Lisbon, &c., which contain a large proportion of sugar unconverted into alcohol. Lastly, some of the dry wines are checked in their fermentation and bottled, so as to be used in a *sparkling* or *foaming* condition, which, however, is not necessarily attending upon any one kind, champagne, Burgundy, Moselle, &c., being all sold either in the sparking or still condition.

The effect of wines upon man depends partly upon the alcohol which they contain, but partly also upon other matters—as, for instance, the astringent wines, which act not only as stimulants, but as tonics, in virtue of the extractive matter suspended in them; and, again, the sparkling wines act more rapidly upon the brain, in consequence of the carbonic acid gas which they contain; besides which, the peculiar acids which are developed in them have a slight diuretic effect, totally different from port wine, which has an opposite tendency. According to Henderson, who is still received as the best authority on the subject, and in whose conclusions on these points I most fully concur, the following are the peculiarities in the effects of the different kinds of wine.

(*a*) "Among the brisk wines, *champagne* may be considered the best, and is the least noxious, even when drunk in considerable quantity. The wines of Champagne intoxicate speedily, probably in consequence of the carbonic acid in which they abound, and the volatile state in which their alcohol is held; and the excitement is of a more lively and agreeable character and shorter duration than that which is caused by any other species of wine, and the subsequent exhaustion less. Hence the moderate use of such wines has been found occasionally to assist the cure of hypochondriacal affections and other nervous diseases, where the application of an active and diffusible stimulus was indicated. The opinion which prevails that they are apt to occasion the gout, seems to be contradicted by the infrequency of that disorder in the province where they are made; but they are generally admitted to be prejudicial to those habits in which that disorder is already formed, especially if it has originated from addiction to strong liquors. With respect to this class of wines, however, it is to be observed, that they are drunk too often in a raw state, when, of course, they must prove least wholesome; also, in consequence of the want of proper cellars, and other causes which accelerate their consumption, they are very rarely kept long enough to attain their perfect maturity. It is also worthy of notice, that in order to preserve their sweetness and promote effervescence, the manufacturers of champagne commonly add to each bottle a portion of syrup, composed of sugar-candy and cream of tartar, the highly-frothing kinds receiving the largest quantity. Therefore, contrary to the prevailing opinion, 'when the wine sparkleth in the glass and moveth itself aright,' it is most to be avoided, unless the attributes of age should countervail all its noxious properties.

(*b*) "The red wines of *Burgundy* are distinguished by greater spirituosity, and a powerful aroma. Owing, perhaps, to the predominance of the latter principle, they are much more heating than many other wines which contain a larger proportion of alcohol. The exhilaration, however, which they cause is more innocent than that resulting from the use of heavier wines. The better sorts may be sometimes administered with advantage, in disorders in which stimulant and sub-astringent tonics are required. The same observation will apply to the wines of the Rhone, and the lighter red wines of Spain and Portugal.

(*c*) "Possessing less aroma and spirit, but more astringency than the produce of the Burgundy vineyards, the growths of the *Bordelais* are, perhaps, of all kinds, the safest for daily use, as they rank among the most perfect light wines, and do not excite intoxication so readily as most others. They have, indeed, been condemned by some writers as productive of gout; but, I apprehend, without much reason. That with those people who are in the practice of soaking large quantities of Port and Madeira, an occasional debauch in claret may bring on a gouty paroxysm, is very possible; but the effect is to be ascribed chiefly to the transition from a strong brandied wine to a lighter beverage, a transition almost always followed by a greater or less derangement of the digestive organs. Besides, we must recollect that the liquor which passes under the denomination of claret, is generally a compound wine. It is, therefore, unfair to impute to the wines of the Bordelais those mischiefs, which, if they do arise in the manner alleged, are probably, in most instances, occasioned by the admixture of other vintages of less wholesome quality.

(*d*) "The wines of *Oporto*, which abound in the astringent principle, and derive additional potency from the brandy added to them previously to exportation (especially those intended for the British market), may be serviceable in disorders of the alimentary canal, where gentle tonics are required. But the gallic acid renders them unfit for weak stomachs, and what astringent virtues they show will be found in greater proportion in the wines of Alicant and Rota, which contain more tannin and less acid; the excitement they induce is of a more sluggish nature than that attending the use of the purer French wines, and does not enliven the fancy in the same degree. As a frequent beverage, they are unquestionably much more pernicious.

(*e*) "For a long time the vintages of *Spain*, and particularly the sacks, properly so called, were preferred to all others for medicinal purposes. The wines of Xeres (sherry) still recommend themselves by the almost total absence of acidity.

(*f*) "Of all the strong wines, those of *Madeira*, when of good quality, seem the best adapted to invalids, being equally spirituous as sherry, but possessing a more delicate flavour and aroma, and though often slightly acidulous, agreeing better with dyspeptic habits. Some have thought them beneficial in cases of atonic gout probably without much cause; for whenever a disposition to inflammatory disorders exists, the utility of any sort of fermented liquors is very doubtful.

(*g*) "The light wines of the *Rhine* and those of *Moselle* are much more refrigerant than any of the preceding, and are frequently prescribed in the countries where they grow with a view to their diuretic properties. In certain species of fever, accompanied by a low pulse and great nervous exhaustion, they have been found to possess considerable efficacy, and may be given with more safety than most other kinds, as the proportion of alcohol in them is small, and its effects moderated by the presence of free acids. They are also said to be of service in diminishing obesity.

(*h*) "It is difficult to conjecture on what circumstances the ancients founded their belief in the innocuous qualities of *sweet wines*, contrasted with the drier and more fully fermented kinds. They may not intoxicate so speedily, and as they clog sooner upon the palate, are perhaps generally drunk in greater moderation. When new they are exceedingly apt to disorder the stomach; and, when used too freely, produce the same effects as the heavier dry wines. In their more perfect state, they may answer the purpose of agreeable and useful cordials; but as the excess of saccharine matter retards their stimulant operation, they ought to be taken in small quantities at a time."

WOMB.—See *Uterus*.
WOMEN, Diseases peculiar to, 167 *et seq.;* treatment of, 497, 504.
WOODY NIGHTSHADE, Treatment of poisoning by, 511.
WORMS, Varieties and symptoms of, 157, 159; treatment of, in children, 330; in the adult, 486, 487.
WOUNDS, Varieties and treatment of, 395, 399.
WRIST-DROP, Nature and Treatment of, 463.
WRY-NECK.—Acute rheumatism of the muscles of one side of the neck; treatment of, 416.

YEAST.—See *Fermentation*.
YEAST POULTICE, 264.
YELLOW FEVER, Nature of, 28; treatment of, 359.
YELLOW-GUM in Infants, 279.
YEW BERRIES, Symptoms of poisoning by, 177; treatment of, 511.

ZINC, Chloride of, 246 (see also *Disinfectants*); oxide of, *ib.*; ointment of, 240; sulphate of, 246.

APPENDIX.

SINCE the first publication of this Manual, several new remedies have come into general use. Some of these are so powerful that they cannot safely be intrusted to any hands but those of the regular medical practitioner, but there are several which can be recommended as of considerable value in domestic medicine.

CARBOLIC ACID.—This powerful antiseptic and disinfectant is obtained from coal-tar oil, by agitation with milk of lime, after which the mass is distilled, carbolic acid, more or less pure, being the result.

1. The Pure Acid is in long colourless prismatic crystals, becoming more or less pink or mauve by keeping, and rapidly deliquescing. It is only to be recommended as an application to decayed teeth.

2. The Impure Acid is sold in the state of solution, and is always tinged with brown, ranging from a pale shade of that colour to a deep chocolate. It is commonly sold as "Calvert's," the strength being marked by numbers. In this condition it is used for sheep-dips, dressing the feet of sheep, horses, &c., and other similar applications, and as a disinfectant. For the latter purpose its smell is an objection, in which respect there is little difference between it and chloride of lime. In human medicine it is sometimes employed in the head eruptions of children, and also as an application to foul ulcers; but for these purposes it is scarcely safe to trust it to unskilled supervision.

CHLORAL HYDRATE.—A white opaque mass, resembling a ripe melon in smell. It is used in modern days very generally as a domestic anodyne and sedative, for which it recommends itself by the absence of any apparent ill effects as compared with opium. But, like all pleasant remedies, it is liable to abuse; and if repeatedly taken, it produces a most depressing effect on the nervous system. In most cases the sleep induced by it, even where great pain coexists, is sound and refreshing; but in some constitutions it seems to act in any safe dose only as a stimulant, and the desired sleep is not obtained. In short voyages, if taken half an hour before leaving harbour, the sleep produced by it is not broken, and no sickness is felt, so that it is a great boon to those who suffer much in that way. But it cannot be relied on for more than one, or at the utmost two, doses; for, if repeated, it not only loses its effect, but it prostrates the nervous system to a most painful extent. The dose as a sedative varies from 10 to even 60 grains, and as a stimulant 3 to 5 grains, combined with 15 drops of chloric ether, and 30 of sal-volatile, mixed with 3 or 4 ounces of water.

CHLORALUM.—A solution of chloride of aluminum, introduced to public notice recently by Professor Gamgee as an antiseptic and disinfectant. It has the advantage, as compared with carbolic acid and chloride of lime, of freedom from offensive smell, and it is alleged that it is equally efficacious with Condy's fluid, which has the same advantage. For use, the preparation, as sold, is diluted with four times its bulk of water.

CHLORODYNE.—A patent medicine, recommended by Dr J. Collis Browne as an anodyne and sedative. It is said to be a compound of chloroform, chloric ether, morphine, hydrocyanic acid, and Indian hemp; but in any case it is a very powerful medicine, which should not be used in the careless way now very generally adopted. There is no reason whatever for supposing it to be superior to other well-known anodynes in common use.

Condy's Fluid.—Permanganate of sodium dissolved in water. This disinfectant is quite free from smell, and is a most effectual remedy for the various noxious odours of the sickroom. A spoonful placed in the nightstool or bedpan answers this purpose completely. It is also used as a wash or injection, but before adopting it for these purposes a surgical opinion should be obtained.

Turkish Bath.—A form of vapour bath introduced into this country a few years ago, by Mr Urquhart, from Turkey. For a short time it was much in fashion, but latterly it has not been so frequently adopted, partly perhaps in consequence of the time, at least, which it wastes. It is a very powerful remedy in various complaints, but it should not be lightly prescribed, as in cases of weak heart, or tendency to apoplexy, there is considerable risk in using it. The hot room, when first entering it, severely tries any weakness in these directions; and hence the caution required. The Turkish bath is also recommended as a means of preserving health, by keeping the skin in good order, but used for this purpose it is liable to great abuse. That it opens the pores, and removes a great quantity of the scarf-skin, as well as the sebaceous secretions of the follicles in the true skin, is easily capable of demonstration, and the attendant points to the towel he has been using as proof positive. But whether our skins are the better for this removal is a question which has not been decided, and I have myself strong doubts about it. The bath increases the appetite, and gives a general tone to the system, which is an advantage when the bather takes a proper amount of exercise; but where the bath is used to restore tone to an overtaxed stomach, and while it thus allows of an increase of stimulating food, no corresponding waste of the system goes on from exercise, an increase of mischief is generally the result, causing disease of the liver, which rapidly puts an end to life. Numerous cases of this termination have come within my own knowledge, so that I am compelled to warn my readers against this dangerous tendency of the Turkish bath.

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Coloured Illustrations of Eruptions

DESCRIBED IN

DOMESTIC MEDICINE AND SURGERY.

I.

VACCINE VESICLES (*Front.*)

This shows the appearance of unhealthy, as contrasted with regular, cow-pox vesicles. The compartments (*d* and *e*) show very unsatisfactory vesicles, upon which no future reliance could be placed, as a protection from small-pox, while *f*, *g*, *h*, and *i* give them as they ought to appear on the eighth, ninth, tenth, and twelfth days respectively.

II.

ERYTHEMA.—(Page 59.)

This beautiful drawing shows this eruption as it so often appears on the child. The specimen is closely bordering on erysipelas, from which it may be distinguished by the absence of the raised edge, and of the large vesicles which generally accompany the latter eruption.

III.

ROSEOLA, OR ROSE-RASH.—(Described at Page 61.)

It is very important to be able to ascertain the appearance of this eruption, which may readily be mistaken for erythema or erysipelas, or may be confounded with measles if occurring over a large surface.

IV.

HERPES ZOSTER, OR SHINGLES.—(Page 62.)

A characteristic but rather extensive specimen of this eruption.

V.

HERPES CIRCINNATUS, OR RINGWORM.—(Page 62.)

This eruption is generally easily recognised by its peculiar red ring. It is, however, well to be able to compare it with scall'd head, which is sometimes confounded with it (see XI.)

VI.

ECZEMA, OR RUNNING SCALE.—(Page 64.)

The accompanying coloured engraving gives a most characteristic view of eczema of the head. It is of the utmost importance to distinguish between this disease and scall'd head for the reasons given in the text—the one being also highly contagious, while the other is the reverse.

VII.

SCABIES, OR ITCH.—(Page 65.)

A good example of this eruption in its earliest stage.

VIII.

PEMPHIGUS.—(Page 66.)

The ordinary appearance of this eruption.

IX.

RUPIA.—(Page 66.)

The scab of this eruption is compared to the limpet shell, which is sufficient to distinguish it from all others.

X.

ACNE.—(Page 68.)

The two most common varieties of acne, are shown in this figure. Simple acne is almost too frequently met with to need illustration, but acne rosacea is so often confounded with erysipelas, that it is well to be able to distinguish between the two eruptions.

XI.

PORRIGO, OR SCALL'D HEAD.—(Page 68.)

This formidable disease of childhood is here very well represented, and by this illustration alone it may be easily recognised when it occurs. It should be carefully compared with eczema and impetigo (VI. and XII.)

XII.

IMPETIGO, OR CRUSTED TETTER.—(Page 65.)

Compare this with eczema and porrigo, in order to detect the points of difference between it and those eruptions, the three being often confounded together.

XIII.

LEPRA, OR LEPROSY.—(Page 71.)

The ordinary appearance of this eruption, which should be compared with psoriasis (XIV.)

XIV.

PSORIASIS.—(Page 71.)

A scaly eruption, very similar to lepra, with which it should be compared.

XV.

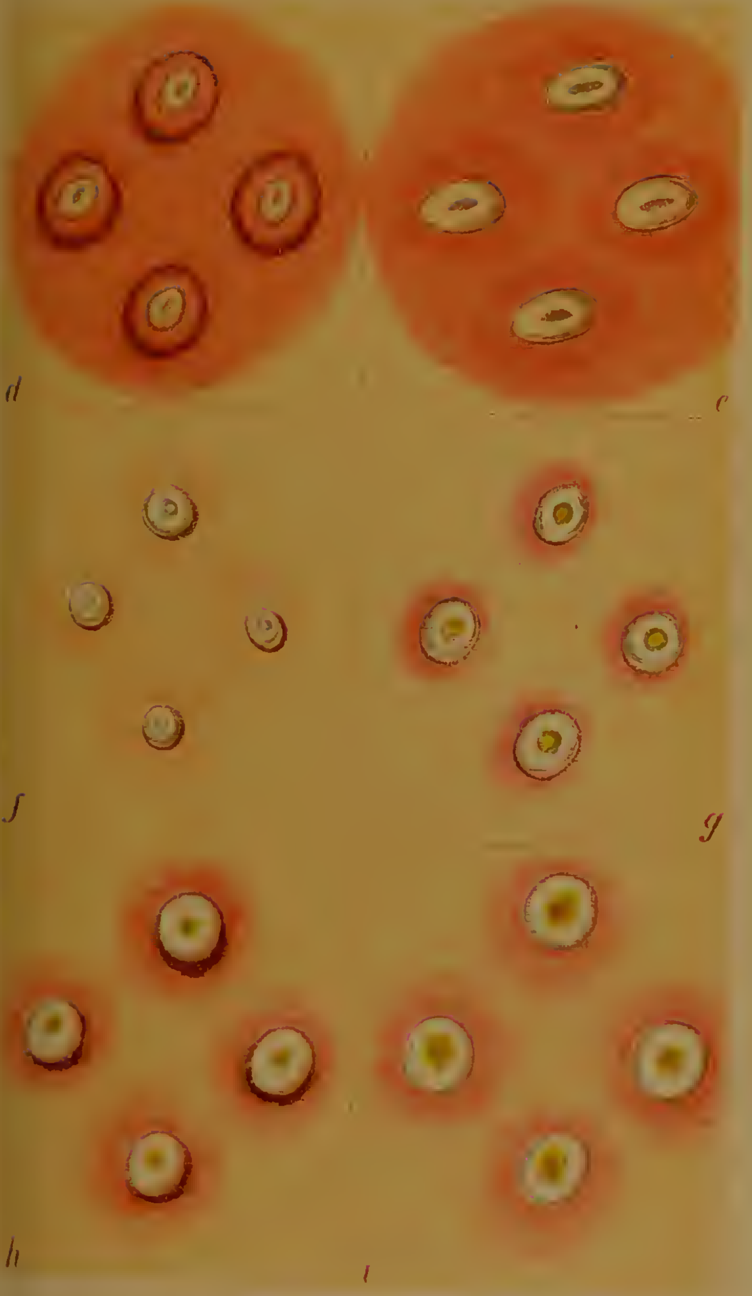
LUPUS, OR CORRODING TETTER.—(Page 72.)

A specimen of that horrible disease which destroys the beauty of so many countenances in this country, and apparently without any cause which can be discovered.

XVI.

a Casual cow-pox on the cow's udder. *b c* Human small-pox transmitted to the cow by inoculation.—*See Mr Ceely's Essay.*

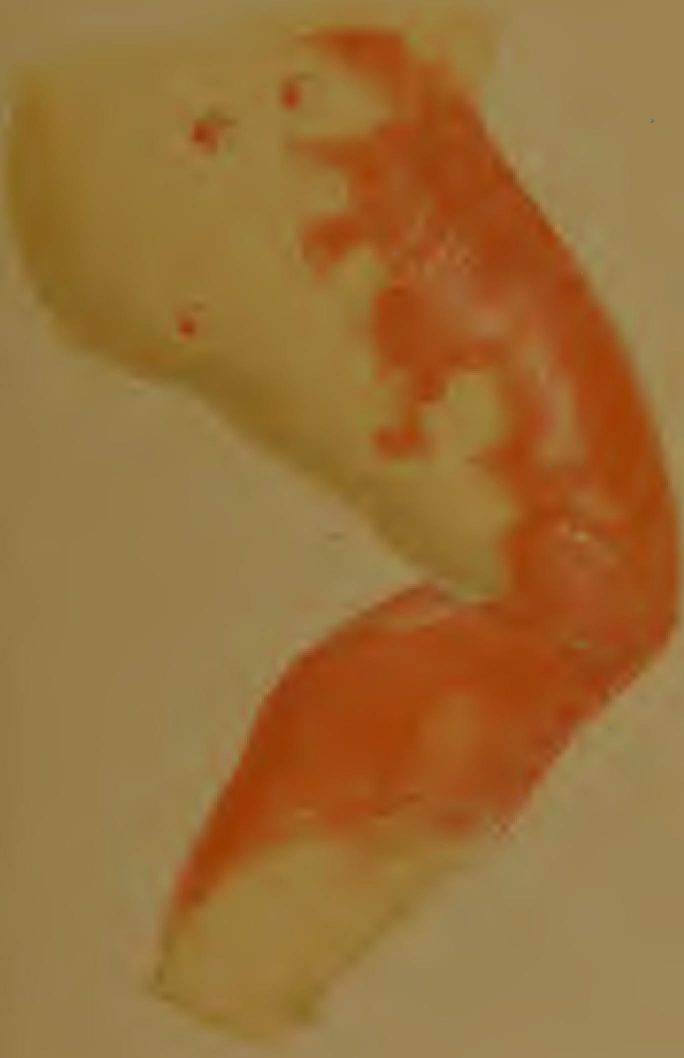
Fig. 2.



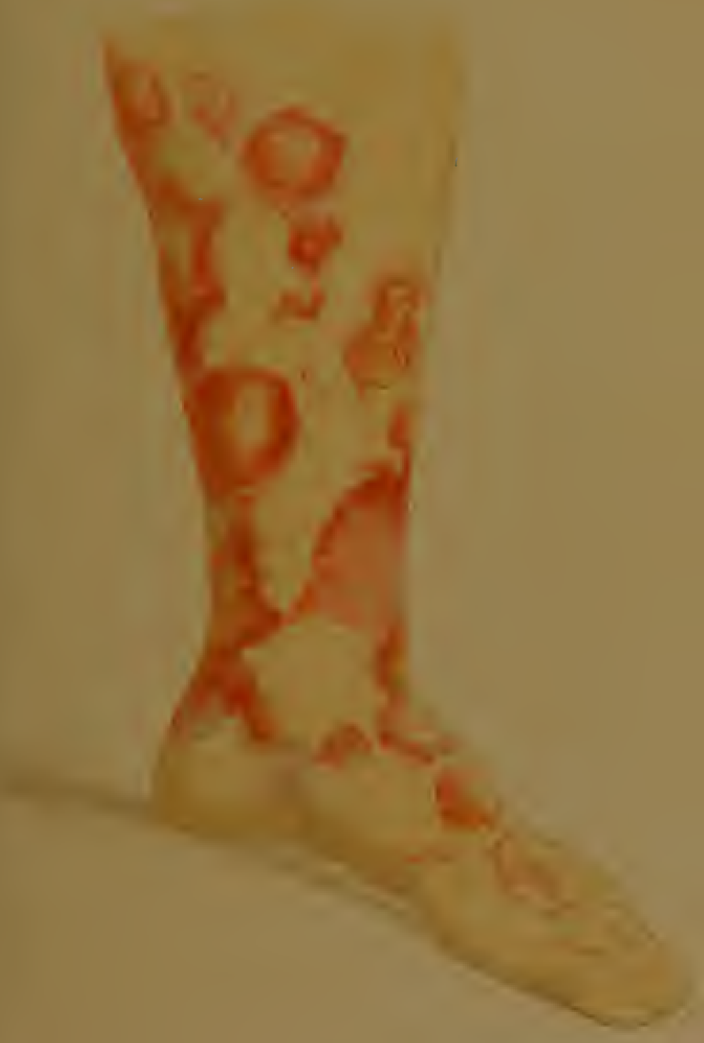
VACCINE VESICLES.

d. e. Unsatisfactory Vesicles.

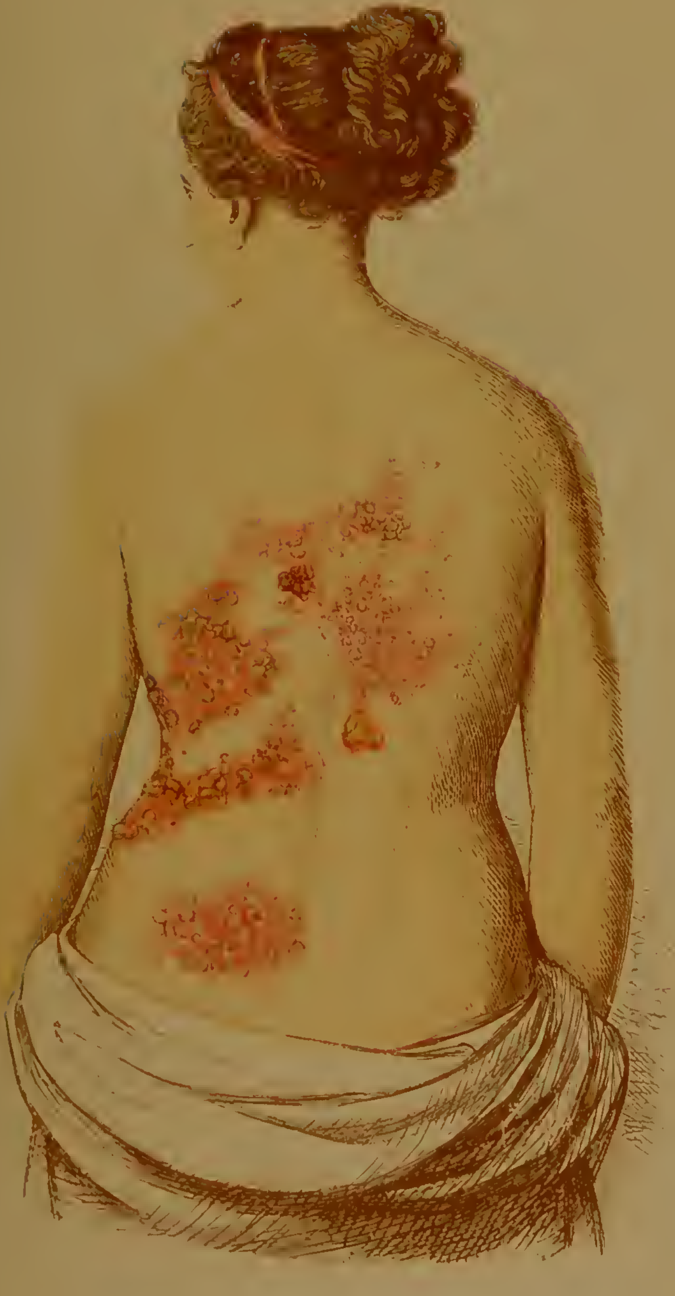
f. g. h. i. Regular Vesicles showing the appearance on the 8th, 9th, 10th, and 12th days.



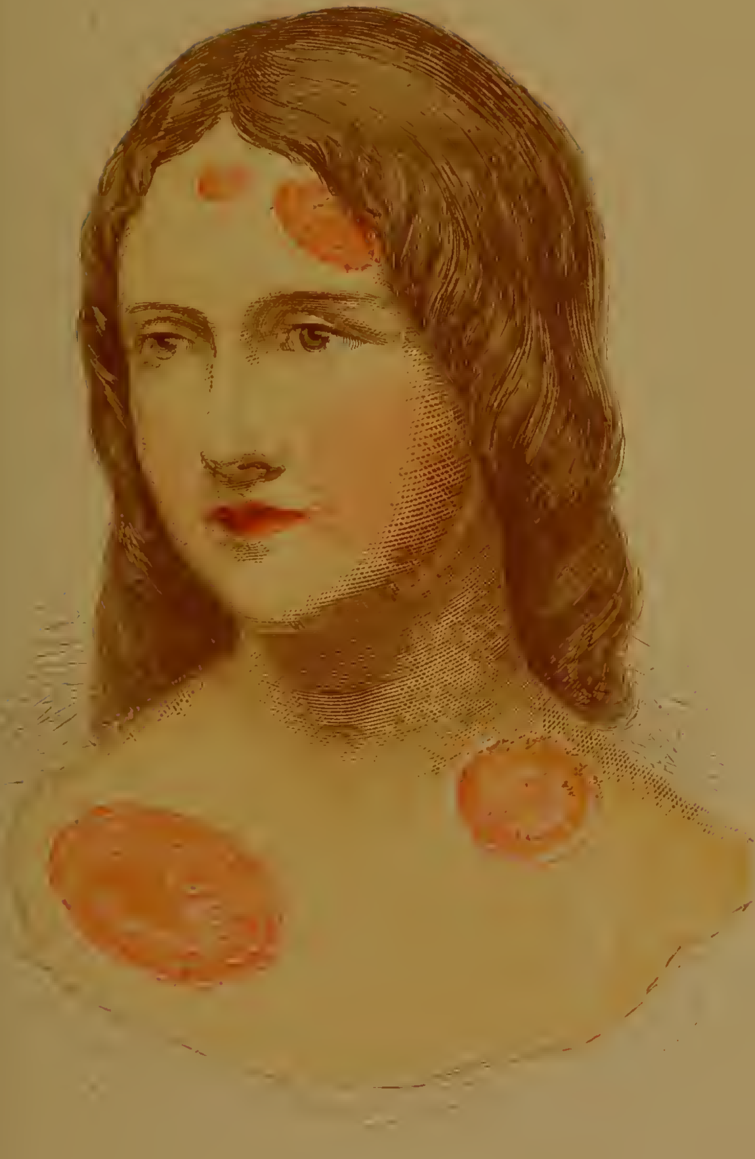
ERYTHEMA



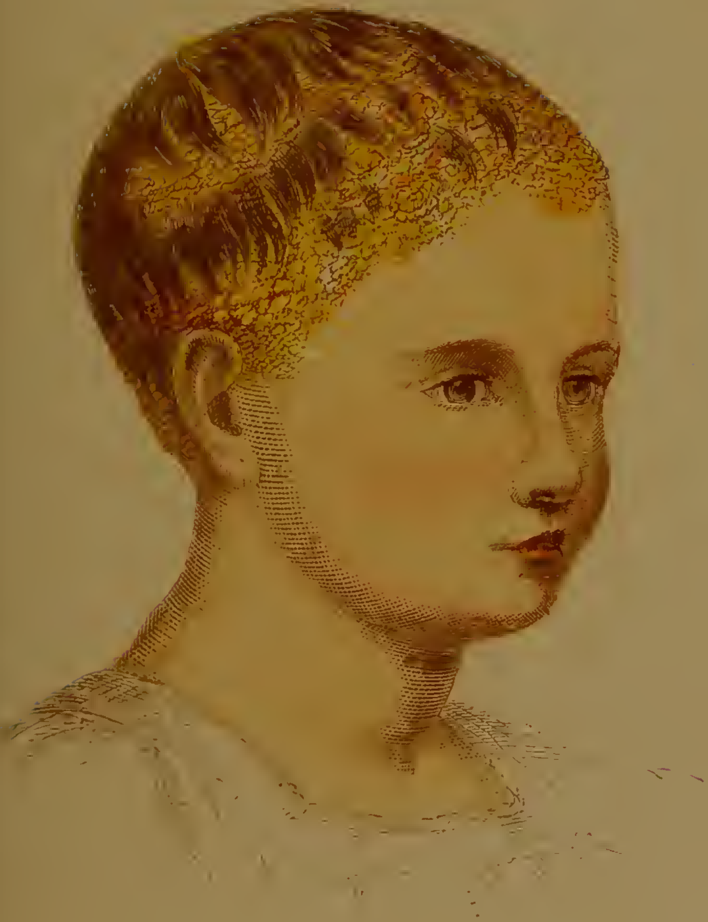
ROSEOLA, OR ROSE-RASH.



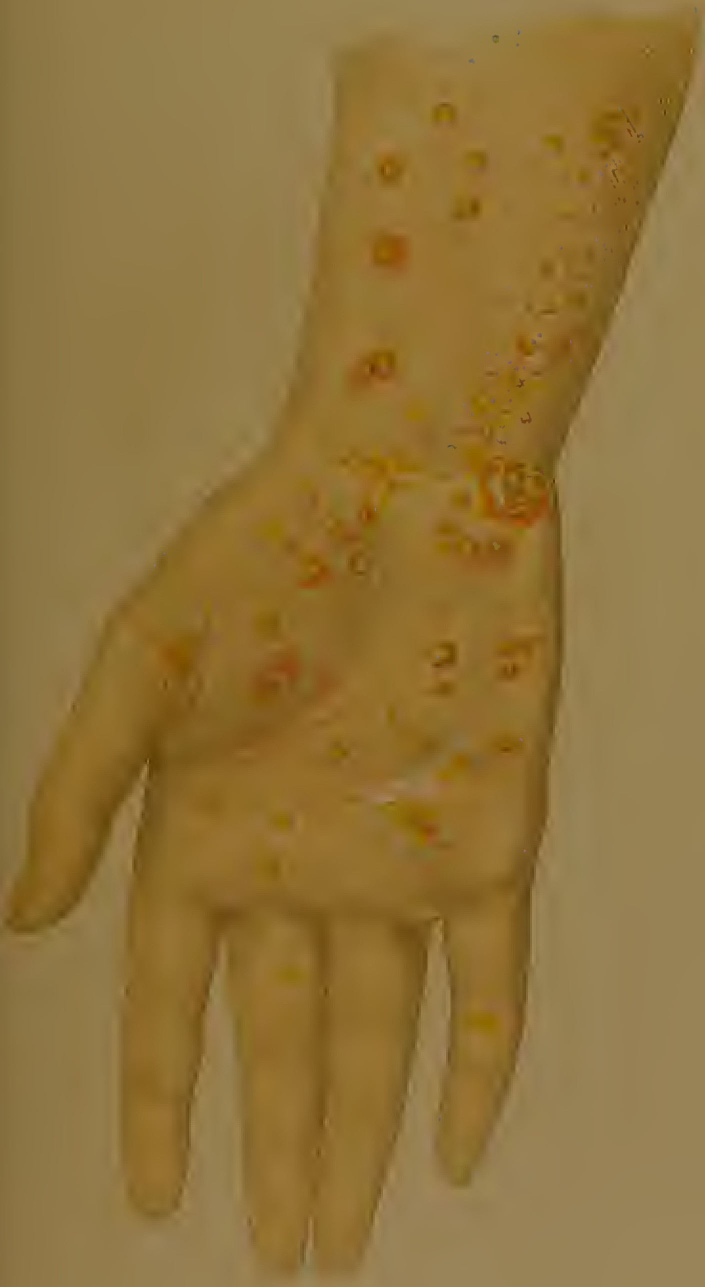
HERPES ZOSTER, OR SHINGLES.



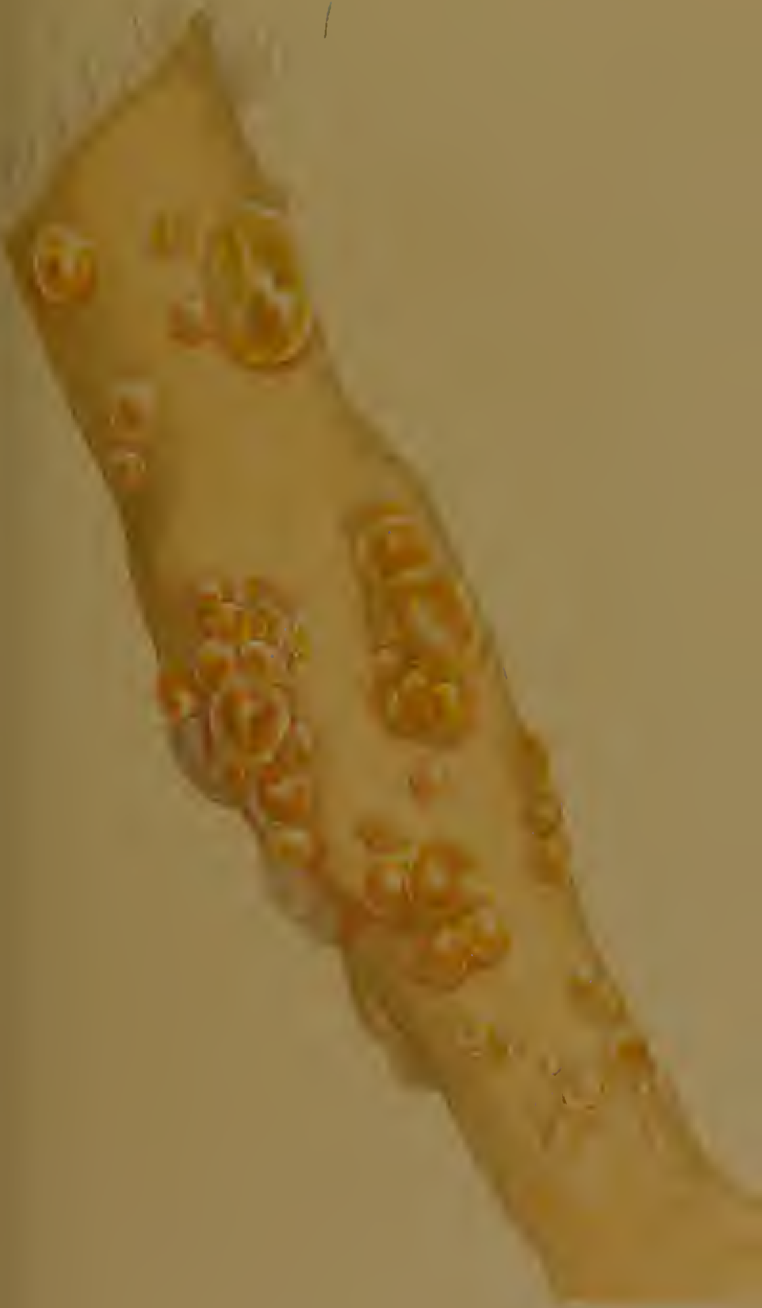
HERPES CIRCINNATUS, OR RINGWORM.



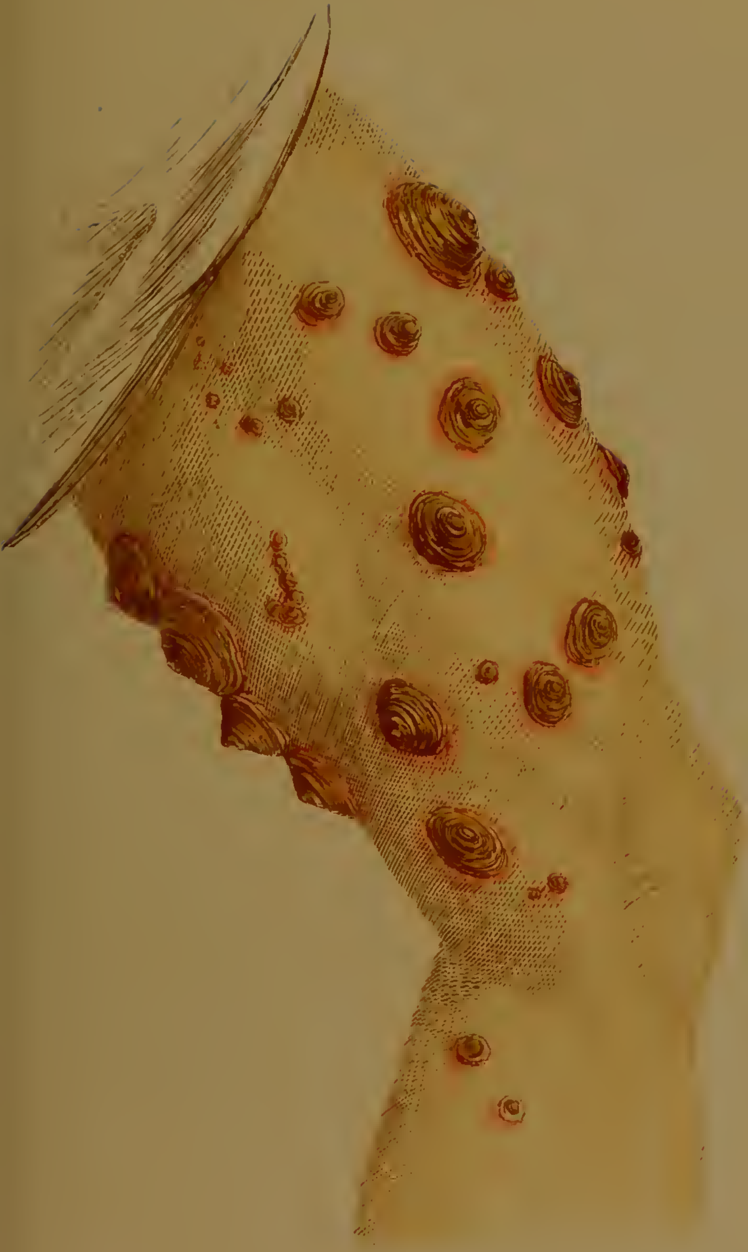
ECZEMA, OR RUNNING SCALE.



SCABIES, OR ITCH.

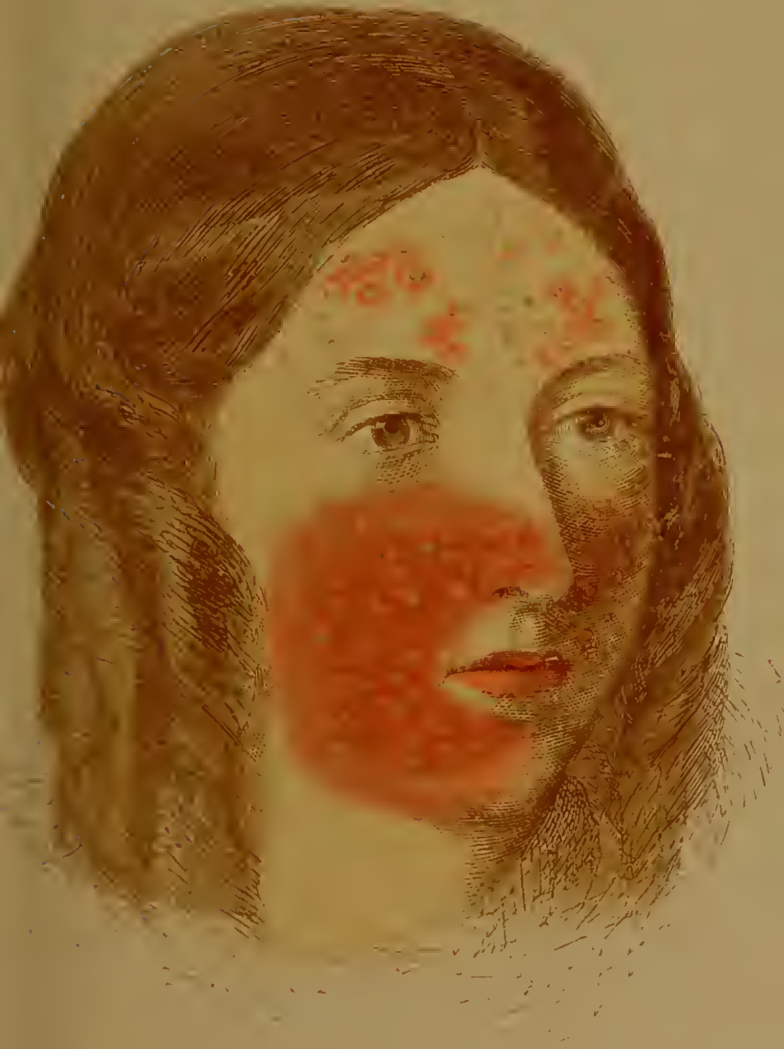


PEMPHIGUS.

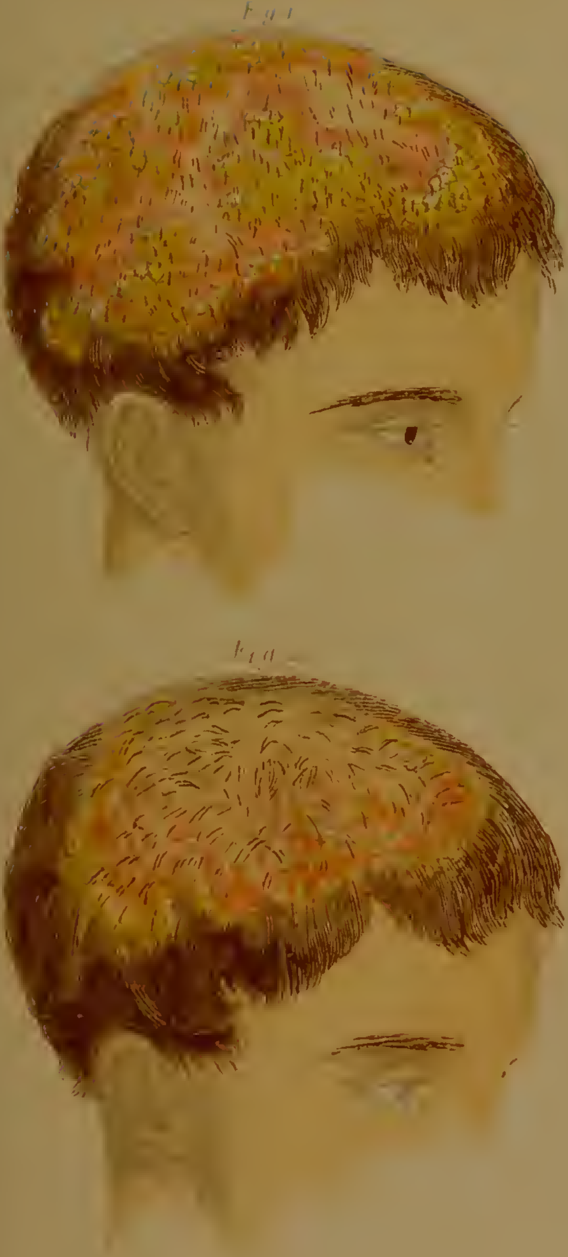


RUPIA.

ACNE SIMPLEX.

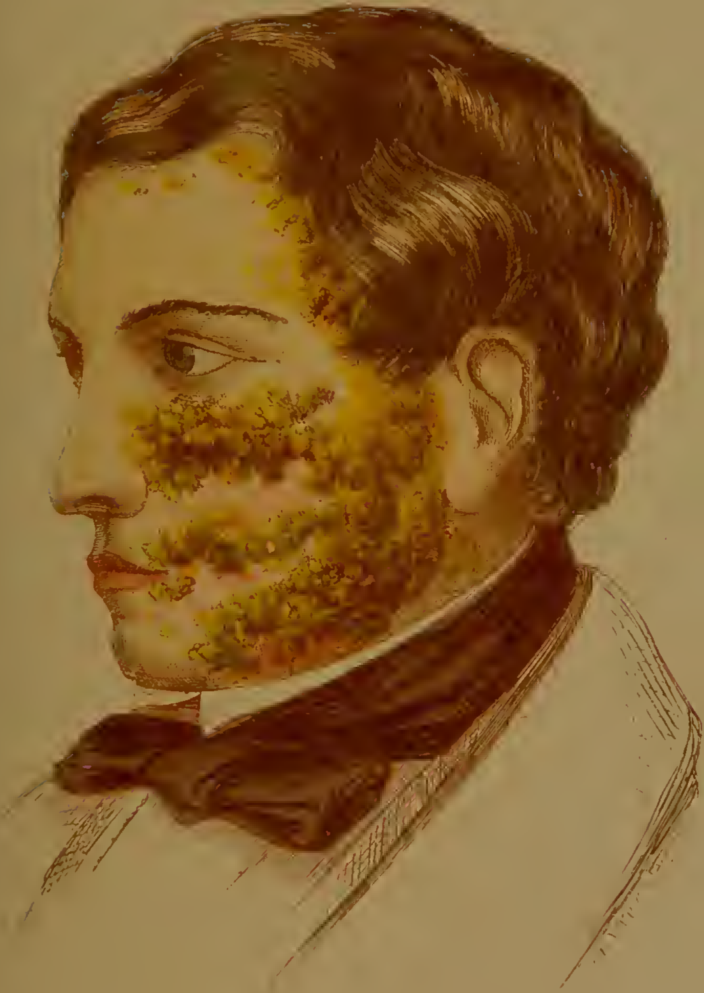


ACNE ROSACEA

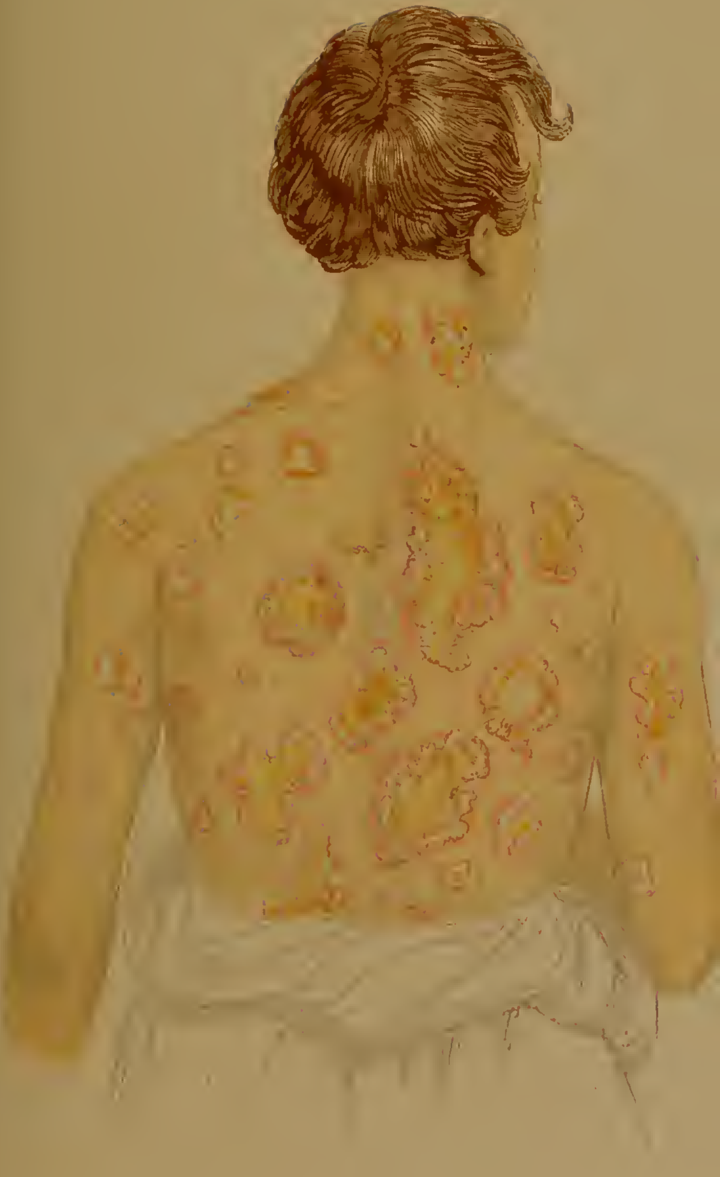


PORRIGO, OR SCALL'D HEAD.

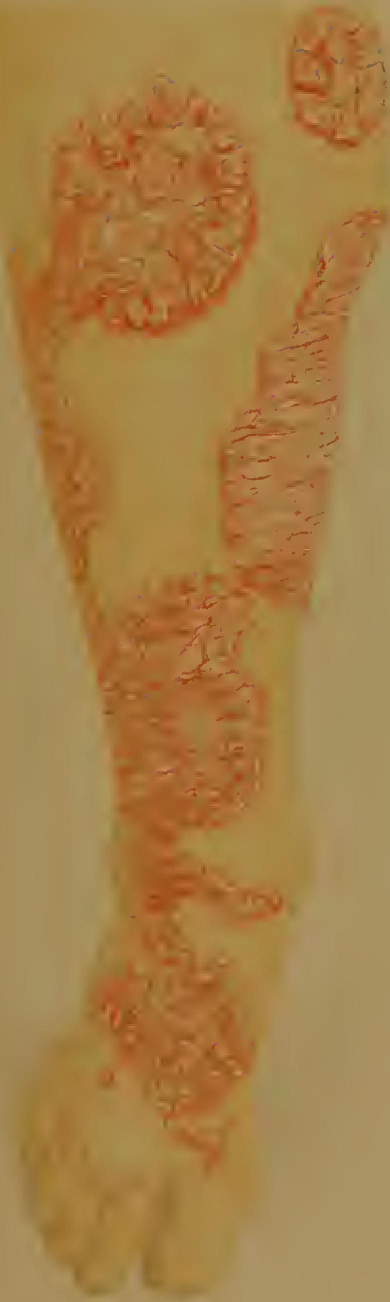
Fig. 1 The full development.
" 2. Progress towards a cure



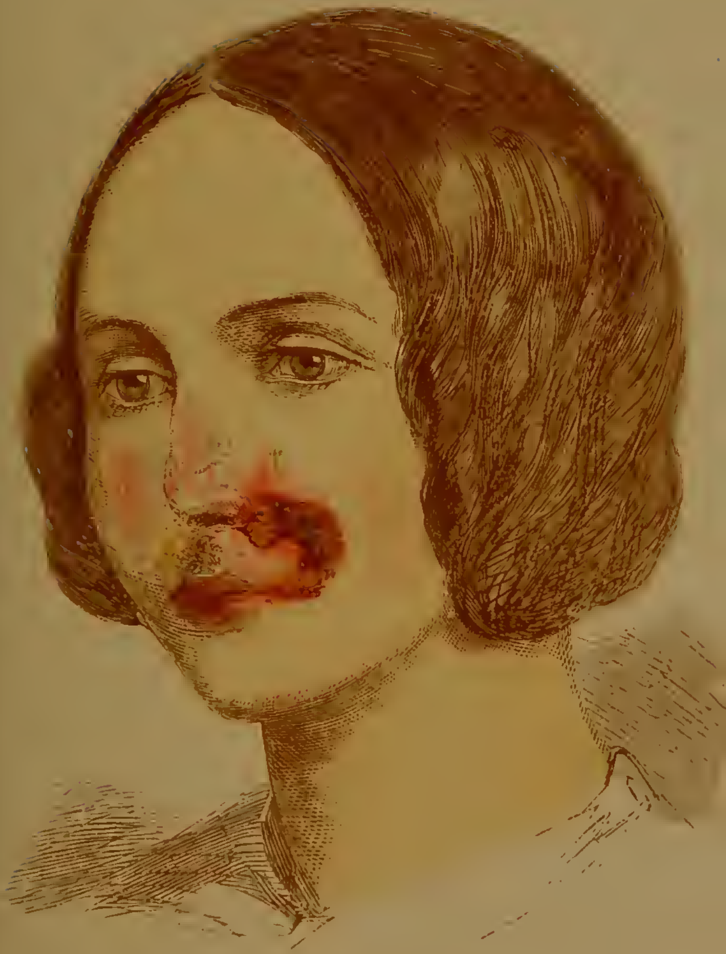
IMPETIGO, OR CRUSTED TETTER.



LEPRA, OR LEPROSY.

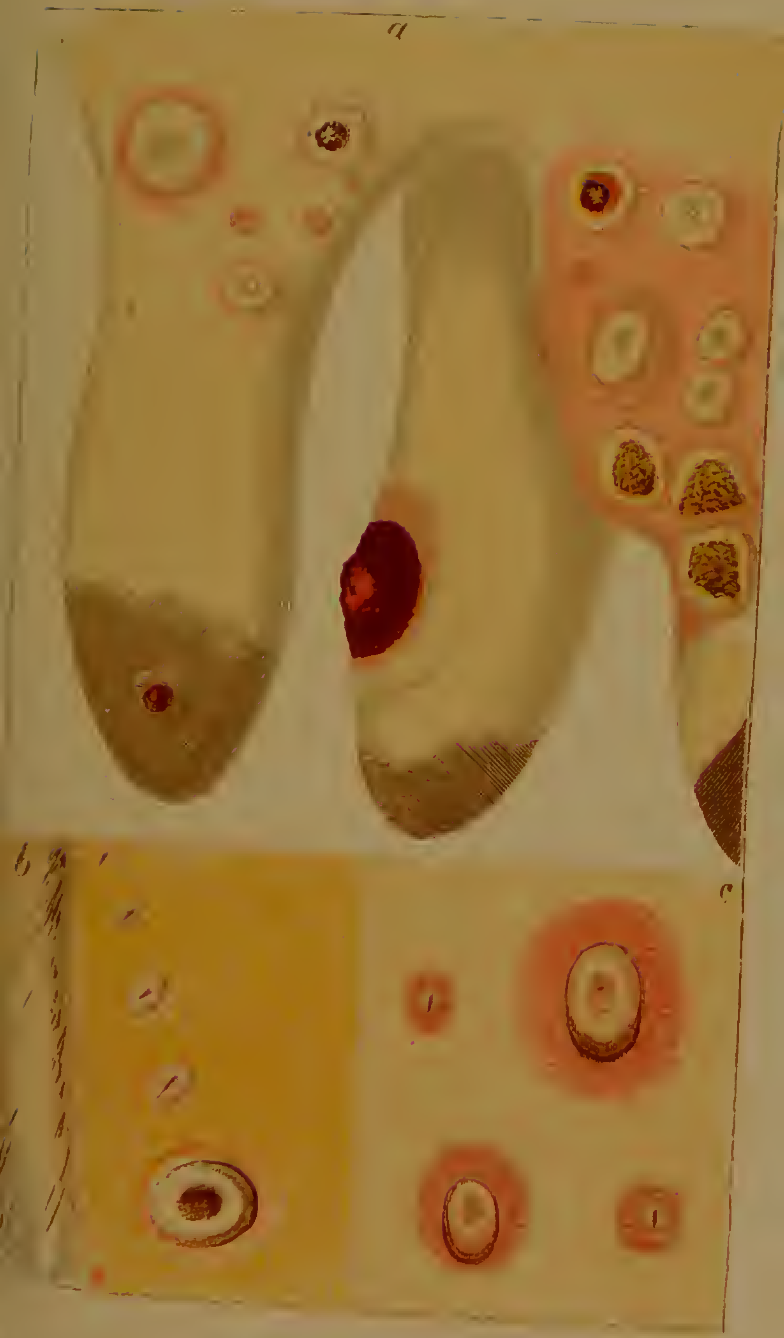


PSORIASIS



LUPUS, OR CORRODING TETTER.

Fig. 1.



a Casual Cow-pox on the cow's udder.
Human Small-pox transmitted to the cow by Inoculation. See Mr, Ceely's Essay